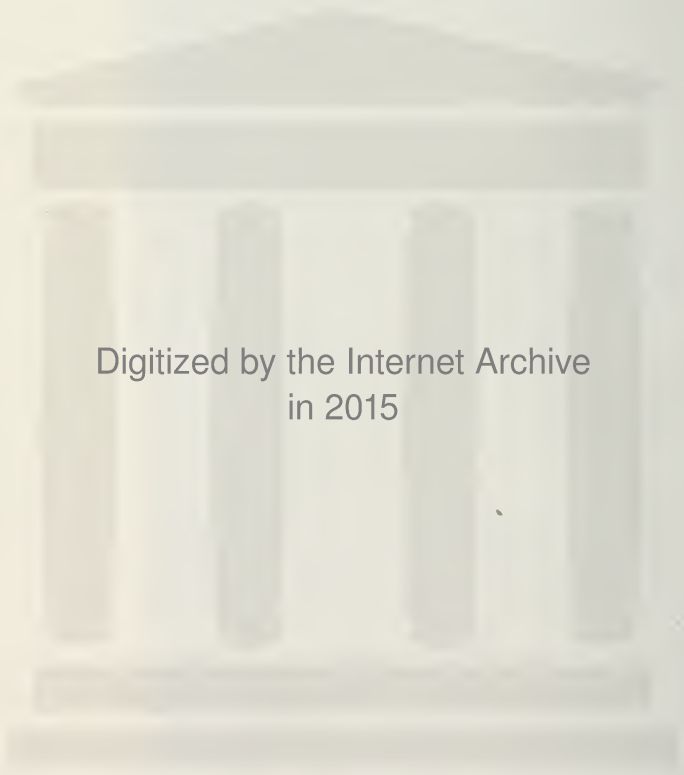


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ANNUAL REPORTS

OF THE

Street Department

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UNIVERSITY OF ILLINOIS

City of New Haven, Conn.,

FOR THE YEAR ENDING

DECEMBER 31, 1874.

NEW HAVEN:

TUTTLE, MOREHOUSE & TAYLOR, PRINTERS

1875.

With the compliments of

CHARLES E. FOWLER,

PLEASE EXCHANGE.

City Surveyor

ANNUAL REPORTS

OF THE

Board of Road Commissioners,

CITY SURVEYOR

THE LIBRARY OF THE
AND

FEB 18 1937

UNIVERSITY OF ILLINOIS

CITY INSPECTOR

OF NEW HAVEN, CONN.,

For the Year ending Dec. 31, 1874.

NEW HAVEN:

TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.

1875.

Board of Road Commissioners.

Chairman.

JOHN B. ADRIANCE.

Term expires Jan. 1, 1878.

Residence, 262 Crown st.

JOHN P. TUTTLE.

Term expires Jan. 1, 1878.

Residence, 120 Howe st.

PATRICK DOYLE.

Term expires Jan. 1, 1877.

Residence, 210 Ferry st.

GEORGE ALLING.

Term expires Jan. 1, 1877.

Residence, 62 Sherman ave.

MINOTT A. OSBORN.

Term expires Jan. 1, 1876.

Residence, 156 Olive street.

Clerk.

FRED. H. WALDRON.

Term expires Sept. 1, 1876.

Residence, 532 Howard ave.

Office, Room No. 9, City Hall. Regular meetings every Thursday evening.

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REPORT

OF THE

Board of Road Commissioners.



*To the Honorable Court of Common Council of the City of
New Haven :*

I have the honor to transmit herewith the Annual Report of the Board of Road Commissioners for the year ending December 31, 1874.

By direction of your Honorable Body there have been transmitted to this Board for execution, during the past year, 160 orders, for the following improvements, viz : Nineteen for sewers ; one for street pavement ; sixteen for opening, widening and extending streets ; twenty-three for grading streets ; eighty-five for walks and curbs ; four for cobbling gutters ; one for repairing Elm street pavement ; one for a new park ; one for laying out approaches to the new Quinnipiac bridge ; one for fencing public park ; one for moving Chapel street bridge tender's house ; one for Belgian blocks between railroad tracks ; six miscellaneous.

In order to carry out the large number of orders emanating from your Honorable Body, this Board have held 65 evening meetings at their office during the past year, and have devoted considerable time during the day to the service of the City in looking after its interests.

The Board have awarded 38 contracts, all to the lowest bidders, after having been advertised several days in each of the City daily papers, viz: sixteen contracts for constructing sewers; eleven for grading streets; five for paving streets; one for furnishing sewer castings; one for furnishing cobbles; one for setting curb; one for mason work, for moving wing wall at Ferry street bridge; one for East street sewer protection, and one for furnishing blue stone. Articles of agreement have also been entered into between this Board and the engineers at the stone crusher and road roller.

SEWERS.

Sewers have been constructed in 25 streets, and curves at six corners, during the past year. The total length of sewers constructed during the time specified above is 18,613 $\frac{2}{10}$ feet, a fraction over 3 $\frac{1}{2}$ miles.

The trunk sewer of drainage district No. 1 has been extended in Canal street from Argyle to Division streets, a distance of about 800 feet, this being the only work done on the main or trunk sewers during the year.

By a reference to Statement No. 5 will be found the sewers constructed in detail.

SEWER PIPE.

The subject of sewer pipe has been discussed at a number of the meetings of the Board. At nearly every meeting when contracts were awarded, parties in the interest of the cement and vitrified pipe have presented themselves to advocate their claims and set forth the merits of their pipe.

On Tuesday afternoon, June 25, 1874, a special meeting of the Board was held for the purpose of settling this vexed question, so far as this Board was concerned. All parties who wished were present to advocate their claims and show the merits of their particular pipe. Parties in the interest of cement, vitrified and silica pipe, were present. The merits of each particular kind were

strongly and persistently advocated. After listening to the arguments, the City Surveyor, at the request of the Board, presented in writing a clear and comprehensive statement of his experience, and the result of a correspondence with engineers in all the principal cities of the Union, which statement will be found in full in his Report, to which the Board invite attention.

Mr. W. S. Pratt, a graduate of Sheffield Scientific School, class '74, was also present, and stated that his graduating Thesis was "Pipes compared, or Cement vs. Glazed for Sewerage purposes." He had made this subject a study, and considered cement as good as any other for the purpose of sewerage, and the cost was considerably less.

The Board, after some further discussion, voted to adopt cement pipe for sewers.

PAVEMENTS.

In accordance with orders from your Honorable Body, Telford pavements have been constructed on Brewery street, from Water to Chapel streets; Court street, from State to Olive streets; Olive street, from Wooster to Water streets; and on State, from Trumbull to Humphrey streets; the total length being 3,176 feet, or a fraction over $\frac{6}{10}$ of one mile. Belgian blocks have also been placed between the rails of the horse railroad tracks on Church street, from Chapel to Elm; Elm street, from State to Church; and a portion of Broadway.

All of the above-named work was done by contract, except the pavement in Court street, which was done by the day; costing 29 cents per square yard more than the Brewery street pavement, that being the most costly of the pavements constructed by contract.

The total length of pavements now in use in this City is a fraction over eleven and one-half miles.

Statement No. 1 contains the length, cost, &c., of all pavements constructed during the past year.

PAVEMENT REPAIRS.

Quite a number of the paved streets have received repairs during the past year. The most extensive repairs were upon the "Egan" pavement on Elm street, from State to Temple streets, which has been thoroughly repaired and placed in excellent condition. The top-dressing of tar and asphalt has been removed, and stone from the crushing works substituted, and the whole thoroughly rolled with the steam roller, making it substantially Telford, and one of the best pavements in the City. The total cost of these repairs, with the Belgian blocks between the rails of the horse railroad tracks, was \$5,010.73.

The Telford pavement on Wooster street, from East to Olive streets, has been top-dressed with stone from the crushing works, at a cost of \$3,987.70. This is the first time any repairs have been made on this pavement since its completion. It is now in a condition to require no more repairs for some years to come.

This mode of repairing Telford pavements has ceased to be an experiment, as experience has proved that the best, cheapest, and, in fact, the only just way to repair these pavements is by top-dressing them with fine stone, and a thorough rolling with the steam roller.

The wood pavements on Chapel and Crown streets have received repairs to the amount of \$1,180.72. The expense of keeping these pavements in repair increases each year, and it is evident that they must soon give place to something more durable.

The total amount paid for repairing pavements during the past year, including Belgian blocks between tracks of horse railroads, is \$17,357.62, which will be found in detail by reference to Statement No. 10.

EAST STREET SEWER PROTECTION.

Upon examining the foundation of the main trunk sewer at the foot of East street, it was found that the borers were making sad havoc with the planking, piles,

&c., and it was decided by the Board to take immediate measures for its protection from further injury and ultimate destruction. Plans were immediately adopted for this purpose, which provided for placing planking lengthwise with the sewer upon the inner row of protection piles, from the surface of the mud to the top of the sewer, after which planking was driven perpendicular into the mud to the depth of eight feet, the whole secured by timber capping, bolts, &c. The space between this work and over the sewer was filled with mud dredged from outside the sewer.

On the evening of Aug. 6, 1874, proposals for this work were opened and the contract awarded to W. S. Pratt, at \$4 $\frac{4}{16}$ per lineal foot, costing, when completed, \$5,337.48. There have been some other repairs upon the protection, such as driving piles, putting in extra bolts, &c., costing \$4,131.98.

As required by the United States government, lanterns have been maintained at the outer end of the sewer, in the night season, during the entire year, at a cost of \$222.97.

STONE CRUSHER.

There have been 9,413 $\frac{3}{4}$ cubic yards of stone crushed at the crushing works during the past year, being 300 cubic yards less than were crushed the year previous. Most of the stone was carted from the rock to the crusher by contract, at 50 cents per cubic yard. There have been but few repairs required at the works during the past year. The insurance of \$5,000 upon the buildings, machinery, &c., is continued. The total amount paid for running the crushing works, including the carting of stone to the works, repairs, &c., has been \$11,485.48. Commissioner George Alling has had the supervision of these works during the year, and has given considerable time to the details of the work and management of the crusher.

ROAD ROLLER.

In January last the roller was taken to pieces for a thorough overhauling for spring use. The driving shaft was taken out and straightened ; two new driving wheels, much heavier than those formerly used, were cast and placed under it, and other needful repairs made. The whole was done under the immediate supervision of Fire Commissioner John H. Leeds, at the request of this Board.

As there has been but little work done during the past year on new pavements, the roller has rendered good service where repairs on Telford pavements were being made. In fact, the roller is an indispensable article in the repairing of Telford pavements, as last year's experience has demonstrated. Whenever the pavements have been top-dressed with stone from the crushing works and rolled down with the steam roller, they are left solid and smooth, with an even surface and a perfect crown to the road bed.

OPENING, WIDENING AND EXTENDING STREETS.

Considerable of the time of the Board at its evening sessions has been taken up in hearing parties in interest in the opening, widening and extending streets, as ordered from time to time by your Honorable Body. A large number of persons have been heard upon these proposed improvements, and the following layouts have been submitted to your Honorable Body for adoption, viz: For extending Spring street to Washington street ; for widening Washington street ; for widening Chapel street, from Sherman avenue to Beers street ; for a new street from Sherman avenue to Punderson street, between Whalley avenue and Goffe street ; for widening Summer place ; for widening Whitney avenue, from Grove to Bradley streets ; for a new street from Broad to Water streets ; for widening and extending Whiting street ; for widening and straightening Oak street, west of Winthrop avenue ; for widening Grand street, near State street ; for widen-

ing the approaches to York square; for widening and straightening Goffe street; for extending Clay street; and for taking triangular piece at the junction of Winthrop avenue and Oak street.

This Board returned to your Honorable Body the order for extending Dow street, with the recommendation that it be rescinded, as all parties, with one or two exceptions, were opposed to the extension; and after hearing all the testimony, the Board were of the opinion that the proposed improvement would not warrant the expense which would be incurred. The Board also returned the orders for extending Ellsworth and Whittemore avenues, with the recommendation that they be rescinded, as it was impossible to carry them out as proposed by the order, which was that they should be extended without expense to the City: as the extension would cross the lands of some parties who were opposed to the proposed improvement, expense must be incurred in condemning and taking their land. In June last a hearing was had for a layout of the approach to the new Quinpiac bridge, but before the layout was submitted to your Honorable Body, it was found that further legislation was necessary by the General Assembly, which legislation was secured at its last session, and this Board have taken steps to secure the approach, and the layout will soon be submitted to your Honorable Body.

GRADING STREETS.

The whole or portions of thirty streets have been graded during the past year, the total length being nearly seven miles. About one-half of this work was done by contract, the remainder being done by day work. In all cases where the work was done by the day the cost was greatly in excess of that which was done by contract. This fact will be seen by reference to Statement No. 3, especially in the grading of Carmel and Sherman avenues. These avenues are adjacent to and parallel with each other; the former was done by contract at a

cost of $12\frac{1}{2}$ cents per cubic yard; the latter was done by day work at a cost of 40 cents per cubic yard. Nearly all the orders from your Honorable Body for grading have been completed.

The order for grading Suburban street was returned to your Honorable Body, with the recommendation that it be rescinded, as it was not absolutely necessary at present and the cost for grading would be great, as the principal cutting was through rock.

WALKS AND CURBS.

Sixty-four orders for walks and curbs have been completed during the past year, of which number nineteen were for brick walks, eighteen were for concrete walks, seventeen were for curbing (independent of those ordered with the paving of walks), two for flag walks, and eight for relaying walks. The total length of the above work is $14\frac{5}{8}$ miles.

A large amount of the above work has been done by the City Inspector in accordance with the Charter and Ordinances, where the parties have neglected to comply with the orders. That officer has caused 85 liens to be placed on the property, to secure the amount to the City, when property owners have failed to pay their bills. A more detailed account, together with a list of liens remaining upon property, will be found in the Report of the City Inspector.

PUBLIC PARKS.

The amount expended upon the public parks during the past year exceeds the amount expended during any previous year, owing principally to the large number of walks ordered by your Honorable Body, and the painting of fences and constructing of a new fence around two sections of Clinton park, Fair Haven. Trees have been set out on these sections of this park, and other work, found in detail below. The amount expended on public parks is \$11,130.08.

II

OLD GREEN.

12350½ square feet turf, ...	\$316.42	
Boxing trees, ...	255.22	
24 new posts, ...	38.50	
Painting fence, ...	75.00	
Curb through Temple street, ...	486.99	
Settees, ...	291.20	
“ freight, carting and painting, ...	80.25	
		\$1,543.58

TEMPLE PARK.

Walk and curb, ...	360.41
--------------------------	--------

WOOSTER SQUARE.

Concrete walk, adjoining on Greene street, ...	217.19	
“ “ Academy street, ...	436.30	
“ through center, north to south, ...	501.08	
“ “ northwest to southeast, ...	498.10	
Board curbing for walks, ...	81.69	
Filling, “	71.20	
9441 square feet turf, ...	236.02	
Painting fence, ...	25.00	
Relaying ½ walk adjoining on Chapel street, ...	316.14	
		2,382.71

CLINTON PARK, 7TH WARD.

New fence around two sections, ...	811.13	
Grading “ “	672.05	
Curb and walk adjoining on Clinton avenue, ...	171.92	
60 trees, ...	120.00	
		1,775.10

UPPER BROADWAY PARK.

4 concrete walks, ...	353.19	
Painting fence, ...	12.50	
		365.69

LOWER BROADWAY PARK.

3 concrete walks, ...	198.24	
Painting fence, ...	12.50	
		210.74

SPIREWORTH SQUARE.

Repairing and painting fence, ...	154.00
---	--------

THOMPSON PARK, 7TH WARD.

Curb adjoining on Chapel street, ...	\$ 39.21
--	----------

OAK STREET PARK.

Curb adjoining on Oak street, ...	43.38
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GENERAL WORK ON PARKS.

Amount paid Superintendent, ...	\$1,798.50	
" labor, ...	1,352.72	
" cutting grass, ...	147.49	
" carting rubbish, &c., ...	547.00	
" tools and repairs of same, ...	409.45	
		4,255.16
		\$11,130.08

TREES.

Considerable attention has been paid to trimming trees by the Board during the past year, and quite a number of trees have been removed by reason of widening streets, constructing pavements, &c. The total amount expended for this purpose has been \$1,821.71.

LICENSES AND PERMITS.

There have been 856 permits issued for connecting with gas and water mains, and 352 to connect with public sewers; 42 licenses have been issued to parties to engage in the business of connecting with gas mains, water mains and public sewers. The amount collected for the above-named licenses and permits is \$1,522.50, all of which has been deposited with the Collector of Taxes.

BRIDGES.

The Board having experienced considerable trouble with the continued settling of the east abutment of the Chapel st. Bridge over Mill River, measures were taken towards making permanent repairs. For this purpose the roadway was excavated to the depth of about six feet for a distance of 200 feet from the face of the abutment, and

piles driven, which were tied together with timbers; the whole was then firmly bolted together; iron bolts or anchors were then placed into the abutment, which was secured to this piling by iron rods, the whole drawn tightly together. The roadway was then filled with oyster shells, since which time there has been no trouble. The total cost of these repairs was \$3,192.00.

In accordance with orders from your Honorable Body, this Board has caused the removal of the Chapel street bridge tender's house (which was upon private lands) to the west side of the channel, in order to enable the Yale navy to erect their boat house. Piles were driven upon the west side of the channel, adjoining the bridge, for a foundation, and the bridge tender's house transferred to that point in November last. A few repairs were made adjoining the house. The total cost for the removal and repairs was \$521.69.

Lewis Bridge, over Quinnipiac River, is in a very poor condition, and the Board are of the opinion that immediate measures should be taken to secure the safety of the present bridge, or the erection of a new one. This matter was the subject of considerable discussion in the early part of the year. The opinion of the Corporation Council was asked upon the subject, which opinion was forwarded to your Honorable Body, with the recommendation that a committee might be appointed to take the matter under consideration and recommend such measures as might secure to the public a safe and convenient bridge at that point.

Quinnipiac Bridge, which crosses Quinnipiac River at Grand street, has been replanked and placed in good repair, at a cost of \$2,526.73.

The bridge crossing the New Haven and Northampton railroad at Prospect street remains in the same condition as it did one year ago. Mr. Chas. N. Yeamans, the President of the above-named railroad, has been requested repeatedly by this Board to remove the northeast wing wall from the roadway of Trumbull street, in order to give the public the full width of the roadway. Copies

of orders to that effect emanating from your Honorable Body have been transmitted to him, but no notice has been taken of them, and the obstruction remains.

OYSTER SHELLS.

The residents of the 7th Ward having several times petitioned that the roadway of East Grand and East Chapel streets might be placed in good condition by top-dressing with oyster shells, the prayer of the petitioners was granted and the work completed last fall. There were 1,464 loads of shells placed upon Grand street, between Mill and Quinipiac Rivers, and 1,039 loads placed upon the roadway of Chapel street, between Mill River and Ferry street, at a cost of \$2,239.50. There were other streets top-dressed in this manner, as will be found by reference to Statement No. 13. The total amount paid for oyster shells was \$3,078.20.

CONCLUSION.

The amount of moneys appropriated to the Board for 1874, for the purpose of carrying out the orders from your Honorable Body, such as opening and widening streets, paving and grading streets, public squares, work at the crushers, turnpiking streets, ordinary labor, and for work in this Department generally, was \$260,000. The total amount expended has been \$234,214.28, leaving an unexpended balance of \$25,784.72. From the amount expended there should be credited to this Department for assessments, &c., returned, as follows :

Amount from assessments for opening and widening streets, .	\$37,406.55
“ “ for paving streets, ...	20,751.11
“ collected for walks and curbs, permits, &c, ...	6,004.05
	\$64,161.71

Making the net expense of this Department for 1874, \$170,052.57.

The gross amount asked for the year 1875 for this Department was \$245,000, which estimate was reduced by the Board of Finance, and an appropriation of \$230,000 allowed. Of this amount it is safe to say that \$50,000 will be returned by assessment.

Many labor under the mistaken idea that the amount asked for by this Board is the net amount to be expended, whereas it is the gross amount. And this Board have long been of the opinion that the amounts collected by assessment, &c., should be credited to this Department. If this was done, and the City Auditor so instructed, the amounts asked for in the annual appropriations could be materially reduced.

By reference to the report of the amount expended under the different heads, it will be seen that the largest amount expended was for opening, widening and extending streets. This is taken from the appropriations made for this Department, and this Board have no control or voice in these expenditures.

The Board respectfully call attention to the Reports of the City Surveyor and City Inspector, and the tables submitted herewith, for further details of work done and expenses incurred in this Department during the past year.

Respectfully submitted, in behalf of the Board of Road Commissioners.

FRED. H. WALDRON, *Clerk.*

City Engineer Department.

CHARLES E. FOWLER, City Surveyor.
ALBERT B. HILL, 1st Assistant Engineer.

Sewerage Department.

CHARLES A. FERRY, Assistant Engineer.
DAVID C. SANFORD, Transitman, etc.

Special Engineering Department.

JOSEPH R. GAWTHROP, Assistant Engineer.
F. FLOYD WELD, Assistant Engineer.
WILLIAM A. COWLES,* Transitman, etc.
HENRY J. KELLOGG,† Transitman, etc.

Surveyor's Department.

CHARLES E. GORHAM, Assistant Engineer.
CASSIUS W. KELLY, Assistant Engineer.
HENRY B. GORHAM, Transitman, etc.
SAMUEL S. HOLLADAY, Transitman, etc.

For Board of Compensation, Notifications, etc.

ANTON COE, General Assistant and Draughtsman.

For Board of Assessment, Notifications, etc.

WILLIAM S. PRATT, General Assistant.

* From April 23 to July 8, 1874.

† From July 20 to Dec. 31, 1874.

REPORT
OF THE
City Surveyor.

*To the Honorable Board of Road Commissioners of the City
of New Haven :*

I have the honor to submit herewith the Annual Report of the work in the City Engineer Department for the year ending Dec. 31, 1874.

SEWERAGE.

This important branch of the work has been, as heretofore, under the more immediate supervision of Mr. A. B. Hill, 1st Assistant Engineer, with Mr. C. A. Ferry, Assistant Engineer, in charge of the construction of the sewers, and the preparation of the assessment maps for the same.

SEWERS BUILT.

At the beginning of the year 1874 there were 26.866 miles of completed sewers in the City, varying in size from twelve to seventy-four inches, internal diameter.

The work of the year has been the construction of 3.525 miles of sewer, 67 catch-basins, 52 receiving basins, 135 manholes, 244 feet of 18 inch culvert, 139 feet of 15 inch culvert, and 3955 feet of 12 inch culvert.

The following table gives the size, material and length of the sewers built during the year :

48 inch brick,	107.5 feet.	18 in. cement pipe, 736.3 feet.	
42 "	1245.8 "	15 "	3697.5 "
36 "	1507.2 "	12 "	2307.7 "
30 "	1263.4 "	15 in. vitrified,	1159.6 "
24 "	5893.2 "	12 "	618.7 "
20 "	44.3 "		
24 in. cement pipe, 32.0 "			18,613.2 "

This amount, equalling 3.525 miles, added to the amount previously constructed, gives a total of 30.391 miles of sewer now completed, divided as follows :

74 inches diam.	0.043 miles.	41.5 inches diam.,	0.514 miles.
72 "	0.178 "	36 "	1.778 "
67.6 "	0.193 "	35 "	0.693 "
66 "	0.500 "	30 "	2.727 "
63.3 "	0.289 "	24 "	7.641 "
60 "	0.671 "	20 "	0.024 "
57 "	0.134 "	18 "	4.658 "
54 "	1.866 "	15 "	4.728 "
52 "	0.184 "	12 "	2.503 "
48 "	0.310 "		
45 "	0.038 "		
42 "	0.719 "	Total,	30.391 "

By reference to the above table, it will be seen that we have more sewers of 24 inches diameter than of any other size. This is partly accounted for by the fact that, in most cases, during the past two years, where our system of sewerage called for an 18 inch pipe sewer, we have substituted a 24 inch brick sewer, of the egg-shaped pattern, as the difference in cost is found to be very small and is more than equalized by the advantage gained.

CONDITION OF SEWERS.

Before our system of sewerage was adopted, sewers had been constructed in many streets, with no reference to the wants of the district to be drained, future extensions, proper grades, connections, &c., a defect that has since caused much damage and inconvenience. In many instances, as far as possible, these faults have been corrected in the construction of other sewers and the build-

ing of curves for the sewer junctions. The most important case during the past year was the improvement at the corner of Church and George streets. At this point the sewer in Church street joined the sewer in George street very nearly at right angles, and both are nearly the same size. The outlet through George street, east of Church street, was not sufficiently large to carry off the immense volume of water that accumulated at this junction at the time of heavy rains, and the result was that many times the cellars along the line of the Church street sewer were overflowed by the setting back of the water in the sewer.

A curve has been built at the corner, giving the sewers the best possible junction, and a connection made with the sewer in Meadow street, by which the ordinary flow of the sewage of the George street sewer west of Church street is taken to the outlet through Meadow street. That portion of the George street sewer between the two curved junctions is retained as an overflow outlet for storm waters. With these improvements, it is believed that most cases, if not all, along the line of the Church street sewer will be relieved from further trouble.

SEWER PIPES.

The question, long under discussion, in reference to the proper kind of pipe to use in the construction of our sewers, was settled at a meeting of the Board in June last, by the adoption of cement pipe. At that time, I submitted the following Report, giving my views on the subject:

To the Honorable Board of Road Commissioners :

For more than two years, in this City, the "sewer pipe question" has been under discussion. The merits of each particular kind in the market have been so strongly and *persistently* advocated by its friends that a person is nearly ready to believe that each kind presented in its turn is the

best one, the only safe one to use, and that all others are failures. Where so much conflicting testimony is presented, where so many examples of durability and failure in every *kind* of sewer pipe are shown, and where the expense of using any two kinds would be different, it is very difficult to decide what *is* the best for us to use, all things considered.

During the past three years I have given this subject considerable thought, have sought the opinion of engineers, and the experience of all the principal cities of the Union. I have also, during that time, had occasion to visit quite a number of places, reaching from Boston at the East to Chicago at the West, and always made it a point to learn all that I could relative to the matter. I have in my possession some two hundred letters, reports, &c., upon the subject of pipes for sewerage purposes. These letters, reports, &c., treat of all kinds of sewer pipe that have been used in this country, and show that in the experience of cities and in the opinions of engineers on this question there is great diversity.

The Scotch vitrified pipe has been, of late, left out of the discussion here, as the decision now appears to rest between the "Akron vitrified pipe," made in Summit County, Ohio, and the cement pipe made here in New Haven.

At the meeting of the Board on Thursday evening, June 18, 1874, it was decided to hold a special meeting this afternoon, for the purpose of hearing testimony in favor of these two kinds of pipes, and I was requested to state to you at the same time my opinion concerning their use.

Although ready and willing at all times to obey the orders or accede to the wishes of the Board, and although in my own mind this question was fully decided some months ago, still, in this particular case, I do regret that in the few days allowed me, I have been unable to find, outside of my other duties, sufficient time to prepare and submit, in proper form, the facts, proofs and reasons for the conclusions arrived at and which I now submit very briefly.

The advantages claimed for the vitrified pipe made at Akron, Summit County, Ohio, are strength sufficient to stand great external and internal pressure, smoothness of surface, thereby reducing friction in the flow of liquids, uniformity in texture, perfect resistance to the action of sewer acids and gases, imperviousness and indestructibility. The defects observed are considerable variation in the degree of hardness to which they are burned; warped and swelled surfaces, thereby causing considerable trouble in making close joints and in laying them to true line and gradient, especially when the grades are light; brittleness, causing quite a large percentage of breakage in transportation and handling; the impossibility of cutting them for connections and other purposes; uneven texture and insufficient strength to resist sudden or unusual crushing pressures.

The advantages claimed for the cement pipe are sufficient strength for all purposes of sewers, increasing with age and use; perfect uniformity in size and cross-section; capability of being cut in any manner without injury to the rest of the pipe; less expense in laying, and, for New Haven, much less expense in cost. The defects observed are disintegration from the action of sewer acids and gases, uneven texture, liability of crushing and breaking, porousness and roughness.

In comparing the Akron with the cement sewer pipe, the fact should be borne in mind that the Akron pipe is made by one company at one place, from material procured in one locality, and should, therefore, if well made, be very uniform; while the cement pipe is made by different individuals and companies, at very many different places, of material procured from all sections of the country, the result of which is, probably, that the quality of the product of no two makers are exactly alike. This fact should be considered when investigating the reports from other cities. At New Haven, in comparing the merits of the two kinds of pipe, we have the Akron that can be furnished of a quality presumed to be standard, and we have the material from which cement pipe can be made, of a quality that few can equal and none excel.

The fact that the Akron vitrified pipe will cost us fully 35 per cent. more than the best cement pipe, should also be considered. In examining the testimony of other cities, I find that both cement and vitrified pipe sewers have crushed in. The reasons assigned are generally improper materials and defective workmanship, either in the manufacture or in the laying of the pipe. Experience shows that good cement pipe will resist unequal pressure, as well as, and withstand sudden concussion even better than the vitrified pipe.

In cities where a fair test has been made of both kinds of pipe, the opinions of their relative merits are very evenly divided. A good Akron pipe, perfect in form, *hard-burned*, and *thoroughly vitrified*, I consider *equal* to any pipe made in the world for sewerage purposes, but do not think it *better* than all other kinds.

I believe that a cement pipe *can* be made that will answer every requirement, and be equal, for all purposes of a sewer, to the best Akron pipe. I believe, also, that in the sharp, clean sand and gravel of New Haven, we have a material for the manufacture of cement pipe that is *not* excelled by any other in the country. Such being our natural advantage, I believe that with first quality of cement, careful and thorough workmanship, we can make a cement pipe equal to the best.

Therefore, believing that we have here the means for making the best quality of cement pipe, and considering the fact that the Akron pipe costs fully one-third more than the cement pipe, it is, in my humble opinion, not only the *best policy*, but *safe* for the City of New Haven to use *cement pipe* in the construction of the pipe sewers in its system of sewerage.

This conclusion has not been arrived at hastily, but after months of earnest study and investigation. When it is known that at one time I was somewhat prejudiced in favor of vitrified pipe; that the views of some of the best sewerage engineers in the world, whose opinions I prize very highly, are adverse to the use of cement pipe as usually made, my present action may create some sur-

prise; but in giving my opinion I cannot do otherwise than state my honest convictions. While I am ready to admit that there may be danger in using cement pipe in the construction of our public sewers, I am *not* satisfied that the danger is sufficiently great as to warrant the extra expense in using the Akron pipe. Neither am I satisfied but that the danger would be nearly if not quite as great in the use of Akron pipe. I should never be satisfied with the use of cement pipe for our sewers except under the most rigid inspection, not only of the pipe itself, but of the materials of which it is made and the making of it. Where cement pipe has failed, it will generally be found that it was from defective material or workmanship. Where the quality and workmanship were good, cement pipe sewers are found to-day harder and better than when first used.

The claim that certain acids act injuriously upon cement pipe I do not think a sufficient cause for condemning their use, for when present in sewage matter they must be greatly diluted, and in that form I am not satisfied that they will destroy good cement pipe.

Respectfully,

CHARLES E. FOWLER,

City Surveyor.

New Haven, Ct., June 25th, 1874.

There is but little now that I could add to this Report, as I have seen or learned nothing since that time that would change my views as therein expressed. In speaking of good cement pipe, I want it understood that I refer to the kind that can be made at New Haven, or at those places where material can be procured equally good. There are many cities, and some in this State, where I believe it is impossible to make *good* cement pipe, with the material to be procured within their limits. In advocating the use of cement pipe for sewers and drains, it is on the condition that the pipe shall be the *best* that can be made.

HOUSE CONNECTIONS.

This very important feature, so necessary to the complete success or efficiency of our sewerage system, has been sadly neglected. In my Report to the Board for the year 1872, I took occasion to call attention to this subject, and suggested the following rules necessary to be observed in the execution of the work.

First, none but thoroughly competent men should be licensed to do the work :

Second, the use of any inferior or imperfect pipe should be prohibited.

Third, the junction with the sewer should be made in a careful and workmanlike manner, and at an angle not exceeding forty-five degrees with the line of the sewers.

Fourth, the pipe should be laid to a true grade, and all joints should be made *water-tight*.

Fifth, there should, in all cases, be a trap of some approved pattern located *between the house and the sewer*.

The work of laying house connections or drains has never been done strictly in accordance with these specifications. Persons have been licensed to do this work who were not competent, or who did not properly perform their duty. Large quantities of pipe have been used that ought never to have been allowed, and it will continue to be used until some regulation is provided and enforced. Pipes have been laid with the joints very improperly made, with little or no attention to the proper grade, and in some cases (discovered during the past year) the pipes at a distance of twenty-five or fifty feet from the sewer were lower than the sewer itself. The instances are very few where suitable traps have been located between the house and the sewer.

This I consider of the greatest importance, and as a sanitary measure should be rigidly enforced. By a very small outlay, the danger and inconvenience of sewer gas in the houses could be entirely obviated.

MAPS.

Sewerage maps have been completed of all work done during the year, and also the necessary assessment maps. This work has been done by the sewerage party when not required in giving the line, grades, &c., of the sewers being constructed.

SEWERAGE SYSTEM.

The success of our system of sewerage seems to be well assured. Thus far all sewers constructed under it have worked admirably, and have proved to be entirely adequate to the duties required. Especially was this proved during the severe and extraordinary storm of last summer. In no instance was any complaint made that a new sewer failed to do its duty, and but few in regard to the old ones. In most cases where trouble has occurred, it has been found that it was caused by defective material or workmanship in making the connections to the buildings, and not from any fault of the sewer.

Some little trouble is caused by deposits in a few of the main sewers, where but few of the lateral sewers have been built. This cannot well be helped, as the sewers just now are never called upon to do full duty, and, therefore, cannot be expected to be self-cleansing. In our work of sewer cleaning, a great saving of time and labor is effected by the use of a sewer cleaning truck, an invention of Messrs A. B. Hill and W. S. McHarg, assistant engineers of this Department. This truck carries two buckets and is so constructed that it can be readily adjusted to run in a sewer of any size, from 24 inches in diameter upwards. With this truck we find that two men can perform fully as much as ten men with buckets.

TABLES.

Street Department Statement No. 5 shows in detail the work upon sewers during the year 1874, giving the locality, the contractor's name, length, size and cost.

In Statement No. 6 will be found the average cutting, nature of excavation and cost per foot of the different sizes of sewer built; while in Statement No. 7 will be found the average contract price during the year of each size of sewer constructed.

In Statement No. 8 is given a comparison of the highest and lowest bids for work placed under contract. To all of these Statements attention is respectfully called.

SPECIAL ENGINEERING.

Considerable work has been done the past year in the division which is designated "Special Engineering." In the Fair Haven District, the Seventh Ward of the City, the work has been to complete the map of the whole section, the surveys for which were made in 1873, and the making of sectional maps of the same territory, on an enlarged and uniform scale, for future use in contemplated improvements. This work has been under the supervision of Mr. J. R. Gawthrop, who has in addition had charge of all work in that district.

The principal portion of the work under this head has been the completion of a thorough system of triangulation of the whole City, surveys, and the plotting of the work on a new map for the use of the City. This, and in fact the whole work of this Department, has been done at times when other duties would allow its prosecution, no attempt having been made at any time in the last three years to forward the work to the detriment of other duties. This may explain somewhat the cause of the delay in the completion of what we term the new City map. The following description has been furnished by Mr. C. W. Kelly, assistant engineer in charge of the triangulation.

TRIANGULATION.

The work of triangulation was begun about the first of March and completed by the latter part of May, 1874. By this method seventy-two points were determined, sixty-two of which are upon the ground and can be occupied; the remaining ten are church spires.

The points upon the ground have all been marked by three-eighth inch iron spikes, sixteen inches long, or by one-quarter inch spikes, twelve inches long, and all have been carefully located by a number of measurements—three, at least, and in most cases four—from the most permanent objects in their vicinity; so that should any of the spikes be disturbed, they may be accurately replaced.

A chain of triangles which had been previously run, from measured bases, along the course of West River, by Mr. A. B. Hill, 1st assistant engineer, in connection with his survey of that section; and also a system which had been established in Fair Haven by Mr. J. R. Gawthrop, assistant engineer, were united in different parts with the main triangulation.

For all the points—except those in Fair Haven—amounting to over one hundred, the rectangular coördinates, with reference to the meridian and parallel through the station on West Rock, at the westerly end of the base, have been calculated. The triangulation has been plotted on a scale of one inch equal five hundred feet, and in the inking a system of graded lines used, which renders the plan of the work more conspicuous. In addition to this plot, a book of tabulated results has been prepared, giving more detailed information.

As a base line we used the distance determined by the U. S. Coast Survey, between their stations on East and West Rocks. This line was a peculiarly fortunate one for the work, because of the sightliness of its stations, its length and its undoubted accuracy, which combined to render entirely feasible a work which, at best, would have been tedious and unsatisfactory, had we been compelled to measure bases upon the ground. We also, with

great advantage to the work, made use of the U. S. Coast Survey Station on the tower of South Church, where we were able to place an instrument.

To establish over a city a system of triangulation, in which all the angles of the several triangles shall be measured, is clearly impracticable. We had, therefore, first to locate from the base a number of church spires, by the aid of which we were able to fix points upon the ground, and in some cases to throw a series of triangles quite around a spire. But yet with this modification and the favorable conditions in the base line, it was, in some parts of the City, a perplexing task to locate the points with a due regard to economy in their use, without introducing ill-conditioned triangles. Since in most cases we could measure but two angles in a triangle, especial precautions were taken in the instrumental work. All angles were successively repeated and read, at least eight times, and for the location of church spires from two to four sets were taken.

The following illustration of the method of taking and reducing the angles is given. The third column, obtained from the second by subtracting the first reading from each of the others, shows a method of averaging used in some cases. Its merit is, that the error in setting the vernier and the personal error are eliminated.

(1)	(2)	(3)
BEW = $77^{\circ} 28' 40''$	$77^{\circ} 28' 40''$	
$154^{\circ} 57' 20''$	$154^{\circ} 57' 20''$	$77^{\circ} 28' 40''$
$232^{\circ} 25' 40''$	$232^{\circ} 26'$	$154^{\circ} 57' 20''$
$309^{\circ} 55'$	$309^{\circ} 55'$	$232^{\circ} 26' 20''$
$387^{\circ} 24' 20''$	$387^{\circ} 24'$	$309^{\circ} 55' 20''$
$464^{\circ} 52' 40''$	$464^{\circ} 52' 40''$	$387^{\circ} 24'$
$542^{\circ} 21'$	$542^{\circ} 21' 20''$	$464^{\circ} 52' 40''$
$619^{\circ} 49'$	$619^{\circ} 50'$	$542^{\circ} 21' 20''$
36 $\overline{2789^{\circ} 13' 40''}$	36 $\overline{2789^{\circ} 15' 00''}$	28 $\overline{2169^{\circ} 25' 40''}$
$77^{\circ} 28' 43''$	$77^{\circ} 28' 45''$	$77^{\circ} 28' 46''$
$77^{\circ} 28' 43''$		
$77^{\circ} 28' 45''$		
2 $\overline{154^{\circ} 57' 28''}$		
$77^{\circ} 28' 44''$		

Several bases of verification were measured, with very satisfactory results, for example:

	Feet.
D ₃ D ₄ —Sherman ave. to Sperry st., on Whalley ave.,	2034.25 measured.
“	2034.36 calculated.
W ₂ W ₃ —Edwards st. to Cold Spring st., on Whitney av.,	2582.95 measured.
“	2583.05 calculated.
P ₃ P ₄ —State st. to near Green st., on Olive st.,	1375.33 measured.
“	1375.22 calculated.
P ₁ P ₂ —Franklin st. to Olive st., on State st.,	2012.15 measured.
“	2012.35 calculated.
S ₁ J ₁ —Water st. to Church st., on Meadow st.,	1387.30 measured.
“	1387.22 calculated.

These lines were all removed by several triangles from the base, and the measurements served in each case as a check upon a series. The line on State street was ten triangles distant, on Olive street eleven, on Meadow street five, and on Whalley avenue and Whitney avenue four each. It is to be noted that the triangles were all the while proceeding from larger to smaller.

The use of a triangulation in a city survey is not as common as its other applications, because of difficulties already indicated. But its indispensable value as a matter of economy and for securing proper accuracy in any considerable survey, by checking errors that might accumulate in the detail work, and furnishing frequently new and accurate starting points, has, in this case, been fully shown in the surveys that have followed.

CITY MAP.

The work upon the new map of the City, which has been carried along at odd times, during the last three years, is now approaching completion. The surveys have nearly all been made, and a large portion of the field work has been plotted. The map is drawn to a scale of one hundred feet to the inch and it will be about thirteen by fifteen feet in size. This does not include the Fair Haven, or Seventh Ward section; that being on a separate sheet. An immense amount of labor has been required

McAdam, ...	.322
Eagan's Improved, ...	.241
Belgian and Telford mixed, ...	.162
Cobble, ...	.142

 10.973

During the year there has been added 0.602 miles of new Telford pavement, and the piece of asphalt pavement on Elm street, known as "Eagan's Improved," has been overhauled and made into Telford, so that at the end of the year we find that there are 11.575 miles of streets paved, and of the following kinds, viz :

Telford, ...	7.672
Belgian, ...	2.228
Wood, ...	.558
Concrete, ...	.491
McAdam, ...	.322
Belgian and Telford mixed, ...	.162
Cobble, ...	.142

 11.575

Too much cannot be said in favor of our Telford roads, as now constructed. The experience of several years in building them has served to improve and better the plans, and to secure the utmost care in their construction. With a sandy and gravelly soil for a foundation, and having convenient to the City a material that cannot be excelled for the construction of this particular kind of road, I think we can very safely defy competition in the building of the *best* pavement at the *lowest* cost.

Statement No. 1 will give in detail the amount of work done, cost, &c., of the new Telford pavements; while Statement No. 2 shows the difference in the bids for the work done by contract. There can be no question as to the advantage of letting all street pavement out by contract, as the cost is greatly reduced, and the work is generally done in a better manner.

GRADING OF STREETS.

During the year, eleven contracts were awarded for grading, covering the whole or portions of sixteen different streets, and in length 3.911 miles. The prices per cubic yard varied from $10\frac{1}{2}$ cents to 45 cents, the average contract price being $20\frac{1}{10}$ cents per cubic yard.

The total amount of excavation under the contracts was 45,194 cubic yards. Complete details of the work, cost, differences in bids, &c., are given in Statements Nos. 3 and 4.

WALKS AND CURBS.

In the summer, or busy season, the giving of grades and lines for the curbing and paving of the sidewalks, ordered by the Court of Common Council, consumes a large portion of the time of one party. The uniform plan or rule adopted by this Department, and which is now generally understood by all curb setters and pavers, is that all grades and lines given are for the curb only, as the grade for sidewalks is, in most cases, a rising grade from the curb of one-half inch in each foot. Curb lines are now placed, with some few exceptions, at distances from the street lines equal to one-fifth of the width of the entire street. This proportion seems to be a very fair one, giving as it does three-fifths of the street for roadway, and one-fifth on each side for sidewalks and trees. The total length of curb line and grades given during the year was eighteen and one-half miles.

MERE STONES.

The location of street corners and the setting of "mere" stones for defining the lines of the streets, is a work of more than ordinary importance, and our endeavor has been to carry it forward as rapidly as other duties would allow. When the grade of the street had been established, the stones have been generally set to the grade of

the inside line of the sidewalk, thus making them answer a double purpose. The number of "mere" stones set during the year was 415, of which 221 were in Fair Haven (Seventh Ward).

SURVEYS AND MAPS.

For all contemplated improvements in the opening, widening, straightening, or extension of streets, ordered by the Court of Common Council, where a hearing of the parties in interest was to be held by the Board, special surveys and maps have been prepared. The maps have been made of a uniform size, in order that they may form a part of a series of sectional maps of the whole City. The number of this class completed during the year was thirty-two. For the use of the Board of Compensation, in assessing the benefits and damages accruing from certain public improvements, there were made twenty-seven maps. In most cases, these maps are made up from the surveys and maps in the office. Assessment maps, showing the frontage, dimensions and ownership of property to be assessed for the construction of street pavements have been made of streets.

The extensive improvements in the vicinity of the new Union Depot will very soon render necessary the opening of several new streets for the accommodation of the public. A plan of the proposed new streets accompanies this Report, showing a layout of an avenue on the north-erly side of the new depot, and the extension of State, Meadow, Columbus, Portsea, and Carlisle streets to connect with it.

Numerous maps, sketches, street profiles, etc., have been made for the use of the Board and committees of the Court of Common Council, all of which are kept on file in the office.

NOTIFICATIONS.

All notices to parties in interest to appear and be heard before the Board of Road Commissioners in reference to

the opening, widening, straightening, or extension of streets; of the Board of Compensation, in reference to the assessment for the same; and of the Board of Compensation for the assessment for sewers and pavements; also all notices to owners of property in reference to connections with sewers, gas or water mains, and for various other purposes, are prepared in or served from this office.

The searching of the land records for the correct titles of property, and the preparation and serving of these notices, requires a large portion of the time of two assistants. The number of notices prepared or served during the year is as follows:

For Board of Road Commissioners, prepared and served,	391
“ “ Compensation, served, . . .	1015
“ “ Assessment, prepared, . . .	1069
“ connections with mains, prepared and served, .	166
“ various other purposes, “ “ . . .	46
	2687

The notices of the Board of Compensation were prepared by the Clerk of that Board, but served from this office. The computation of the assessments and the preparation of the notices of the Board of Assessment were done in this office, but the notices were served by the Clerk of that Board.

GAS AND WATER MAPS.

A map of the City, showing the location of every gas and naphtha lamp, has been completed, and one is now well under way showing the location of all water mains and hydrants. The gas lamp map was prepared for the use of the Committee on Lamps, while the one now being made is for the use of the Fire Department.

CONCLUSION.

In closing, I desire to return my sincere thanks for the uniform kindness and assistance that I have received from the members of the Board. To Mr. P. Ward, the

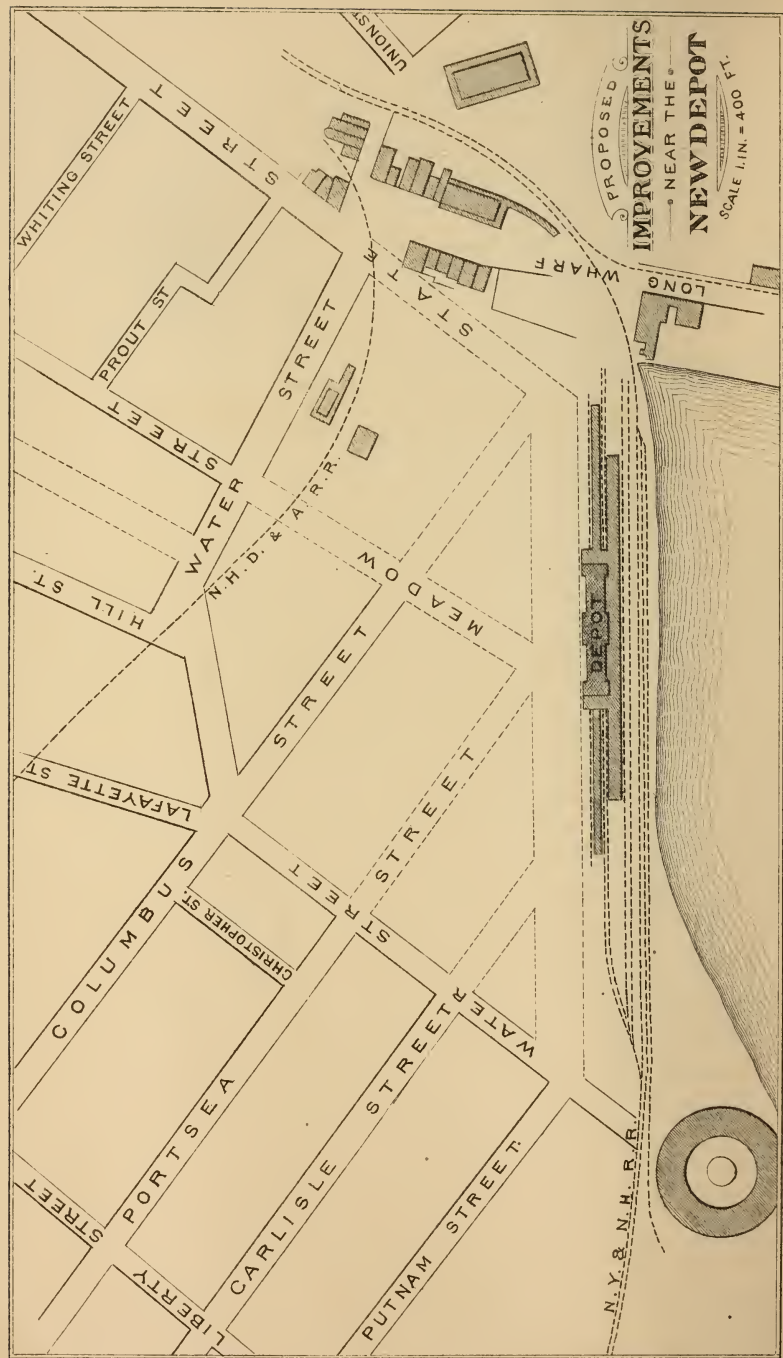
City Inspector, and Mr. F. H. Waldron, the Clerk of the Board, I am under renewed obligations for assistance and many favors shown.

The members of the City Engineer Department, for their faithfulness in the service of the City, are deserving of much credit, for to their accuracy and strict attention to duty is greatly due the successful completion of our year's work.

Respectfully,

CHARLES E. FOWLER,

City Surveyor.



City Inspector's Department.



City Inspector.

PATRICK WARD.

Term expires Sept. 1, 1876. Residence, junc. Howard and Kimberly aves.

Clerk.

FRED. H. WALDRON.

Office, Room No. 9, City Hall.

REPORT
OF THE
City Inspector.

To the Honorable Board of Road Commissioners of the City of New Haven :

I have the honor to submit herewith my fourth Annual Report, it being a statement of work performed in my Department for the year ending December 31, 1874.

REPORT.

The matter of turnpiking streets is one of the most important items in my Department. Ninety-two streets have been turnpiked during the year, at a cost of \$8,620.55. The cost of turnpiking some of these streets is greater than it should be, as at times carts and men have been put upon the work at the suggestions of members of your Honorable Board, more for the purpose of giving them employment rather than from an actual necessity for doing the work. I question very much the propriety of the City doing this (charity) work, as provision is otherwise made. Yet I am willing at all times to carry out the wishes of your Honorable Board.

The largest amount of work was done on Prospect street, between Sachem street and the City line, a distance of one and one-quarter miles, at a cost of \$1,213.35.

This road is now in excellent condition, and is one of the finest drives in the City. An order was passed for turnpiking Cold Spring street, but the work done might come under the head of grading rather than turnpiking; there was some filling and a small amount of cutting done; this was rendered necessary to carry off the surface water, and properly drain the roadway, otherwise the water would have remained midway between Whitney avenue and Orange street, to the detriment of health and travel. The total length of streets turnpiked is nearly twenty miles. A detailed report will be found by reference to Statement No. 11.

In accordance with recommendations from your Honorable Board, I have top-dressed (frosted) some of the dirt streets with fine stone from the crushing works. How well the experiment has worked you can judge as well as myself. The amount expended for this work was \$954.00, as will be seen by reference to Statement No. 12.

I have also, in accordance with your suggestions, had oyster shells placed upon the roadway of three or four streets. This is an expensive way of repairing our roads, and I doubt very much whether the improvement (which is but temporary) warrants the expense.

SIDEWALKS AND CURBS.

The length of sidewalks completed during the past year has been nearly fifteen miles, embracing work in sixty-five streets. A large amount of this work has been done by the City, at an expense of \$5,696.47. Whenever parties have failed to pay the expense within the time specified, I have, in accordance with the Charter and Ordinances, placed liens upon the property fronting upon the work. There are, at the close of the year, sixty-nine liens, amounting to \$4,877.16, remaining upon property, which were placed thereon during the year.

Many persons take advantage of the present manner of doing this work, and throw the burden upon the City, for the reason that in many instances the City do the work

cheaper than individuals can, and they have none of the care and trouble of the work. I would respectfully suggest that a certain percentage be added to these bills, when work is done at the City's expense, to cover the expense of looking after the work, inspecting, making out bills, &c.

Statements Nos. 15 and 16 contains a list of walks constructed and liens remaining upon the property for work during the year.

CROSSWALKS AND GUTTERS.

One hundred and forty-two new crosswalks have been constructed, in accordance with your orders, being twenty-two more than were constructed during the previous year. I have also caused about eighty crosswalks to be relaid and otherwise repaired. The total cost for the above work was \$13,053.78. I have also caused 10,770 square feet of gutters to be cobbled, agreeable to orders, as follows: Vine street, 4,740 square feet; Prospect street, north of Sachem street, 892 square feet; Orchard street, between Dickerman street and Goffe street, 1,955 square feet; Exchange street, from Pearl to Front street, 2,849 square feet; East Chapel street, 334 square feet; the cost of which was \$817.69.

The location of new crosswalks will be found by reference to Statement No. 14.

BRIDGES.

The causeway upon Barnesville Bridge being continually in poor condition, by constant traffic, I caused the same to be thoroughly repaired by placing upon the roadway stone from the rock and crushing works, to a depth of six inches, giving it a sufficient crown to carry the surface water into outlets constructed under the walks. This partial paving will obviate the trouble of continual repairs upon the causeway. Although costing \$602.85, I think it will prove a saving to the City.

During the grading of the extension of Henry street I caused to be constructed a small bridge or culvert over Beaver Creek.

SEWERS AND BASINS.

On account of the steep descent of the streets leading into Oak street, between York street and Congress avenue, the heavy rain storms carry large quantities of sand from these streets into the Oak street sewer, which renders it necessary to clean this sewer quite often, at considerable expense. I would recommend that some action be taken to obviate this trouble, either by cobbling the gutters or substituting the new style of basins in place of the old ones now in use.

The Canal, Lock, Prospect, Trumbull, Silver, and Water street sewers have recently been cleaned, and are now in good condition. I have kept a gang of men doing this work and cleaning catch basins; the cleaning of basins has been done principally in the night season, when there was the least amount of travel, which is much more pleasant for all concerned.

The number of basins cleaned during the season has been 396, some of which I am obliged to clean after every heavy rain. The smallness of these basins renders constant watching necessary, as the evaporation of the water in the summer time require them to be many times filled with water to prevent sewer gas from escaping through them, to the detriment of health. As there are now a large number of basins in use and a number of miles of sewers in this City, the matter of cleaning them is of considerable importance and is constantly increasing. I have endeavored in the winter season to keep the inlets free from snow and ice, so that in case of a sudden thaw or heavy rain they would be in readiness for the work designed for them.

CLEANING PAVEMENTS.

The pavement-cleaning machines, purchased a year ago, have been in use a large amount of time since they were placed in my hands. They have rendered good service and saved considerable labor. Two men with one of these machines can do the work of eight men with ordinary hoes. Another advantage is they do not injure our Telford pavements.

There has been a large amount of work done on streets where there is no curbing, by reason of the heavy rains washing dangerous ruts or gullies in the roadway. Especially has this been the case on Derby and Winthrop avenues and other streets, where heavy fills have been made, requiring large quantities of earth to fill the roadways and place them again in good repair.

CONCLUSION.

In conclusion, permit me to return thanks for your confidence and support in my endeavors to carry out the wishes of your Honorable Board.

To the City Surveyor, Mr. C. E. Fowler, for his uniform kindness and valuable assistance, I would return thanks; also to his gentlemanly corps of engineers, who have always been ready and willing to assist me whenever I have called upon them.

To Mr. Fred. H. Waldron, the faithful Clerk, I feel under many obligations, especially for his kindness during my recent illness, at which time he took the care and responsibility of the outdoor work of my Department, obliging him to do his office work when the duties of the day were over.

Respectfully submitted,

PATRICK WARD,

City Inspector.

STREET DEPARTMENT. STATEMENT No. 1.

Streets Paved during 1874.

STREET.	Between what Points.	CONTRACTOR.	Kind.	Length in Feet.	No. of sq. yds.	Cost per sq. yd.	Total Cost.
Brewery, -----	Chapel to Water,-----	Patrick Dowling, -----	Telford, ----	1,003	2,664.34	\$1.55	\$4,129.73
Court, -----	State to Olive, -----	City, -----	Telford, ----	552	1,526.00	1.84	2,807.84
Olive, -----	Wooster to Water,-----	Chas. W. Blakeslee,-----	Telford, ----	578	1,963.46	1.52	2,984.45
*State,-----	Trumbull to Humphrey, -----	Richard Connor, -----	Telford, ----	1,861	9,218.18	1.60	14,749.09

* Commenced in 1873.

STREET DEPARTMENT. STATEMENT No. 2.

Highest and Lowest Bids for Street Paving in 1874.

STREET.	HIGHEST BID.		LOWEST BID.	
	Contractor.	Amount.	Contractor.	Amount.
Brewery, -----	J. C. Miller, -----	\$3,996.01	Patrick Dowling, -----	\$3,676.79
Broadway, -----	Patrick Dowling, -----	1,407.42	G. Pohlman, -----	980.79
Church, -----	G. Pohlman, -----	2,423.15	Chas. W. Blakeslee, -----	2,252.51
Elm, -----	Patrick Dowling, -----	1,571.30	G. Pohlman, -----	1,095.00
Olive, -----	Thomas Colwell, -----	2,945.19	Chas. W. Blakeslee, -----	2,640.85
State, -----	Patrick Dowling, -----	14,610.82	Richard Connor, -----	13,550.72
		\$26,953.89		\$24,196.66

Difference in amounts, \$2,757.23.

STREET DEPARTMENT. STATEMENT No. 3.
Streets Graded in 1874.

LOCALITY.	CONTRACTOR.	Length in Feet.	No. of Cu. yds.	Cost per Yard.	Total Cost.
Button st., near Lamberton,-----	John Roach,-----	400	1,154	\$0.10½	\$ 121.17
Canal st., Sachem to Argyle,-----	John P. Thompson,-----	2,895	5,050	.45	2,272.00
Carmel ave., Whalley ave. to Goffe st.,-----	Chas. W. Blakeslee,-----	1,352	5,875	.12½	602.19
Chapel st., Norton to West River,-----	Patrick Leonard,-----	1,571	7,325	.11½	860.69
“ “ “ “-----	“ day work,-----	-----	-----	-----	591.50
Cottage st., Foster to Orange,-----	James A. Davis,-----	690	201	.23	46.23
*County st., Henry to Goffe,-----	Chas. W. Blakeslee,-----	1,215	3,461	.12½	432.62
Crescent st., Goffe to City Line,-----	“ “-----	885	2,316	.14	324.24
Derby ave., Winthrop ave. to West River,-----	City,-----	2,450	-----	-----	915.95
*Edwards st., Whitney ave. to Orange st.,-----	Patrick Rourke,-----	1,190	981	.15	147.15
Ellsworth ave., at Chapel st.,-----	Patrick Leonard, day work,-----	350	-----	-----	210.75
Foster st., Edwards st. to the Meadows,-----	James A. Davis,-----	2,250	2,987	.23	687.00
Gilbert ave., Elliott to Greenwood st.,-----	Chas. W. Blakeslee, day work,-----	712	-----	-----	236.38
“ Winthrop ave. to Greenwood st.,-----	Patrick Leonard, “-----	1,092	-----	-----	210.75
Greenwood st., Oak to Sylvan ave.,-----	“-----	618	1,195	.35	418.49
“ “ George st.,-----	Chas. W. Blakeslee, day work,-----	1,260	-----	-----	114.50
Henry st., County to Crescent,-----	“ “-----	896	2,315.5	.14	324.17

STREET DEPARTMENT. STATEMENT No. 3.—CONTINUED.

47

LOCALITY.	CONTRACTOR.	Length in Feet.	No. of Cu. yds.	Cost per Yard.	Total Cost.
Humphrey st., Whitney ave. to Orange,-----	John Smith,-----	1,069	2,370	\$0.25	\$592.50
Kimberly ave., on the Causeway,-----	City,-----	650	-----	-----	480.37
*Lamberton st., R. R. tracks to the Meadows,-----	John Roach,-----	1,410	4,571½	.10½	480.01
*Mechanic st., State st. northerly,-----	City,-----	350	-----	-----	470.01
*Morris st., near Lamberton,-----	John Roach,-----	200	86	.10½	9.03
Norton st., Chapel to Derby ave.,-----	Patrick Leonard, day work,-----	466	-----	-----	210.75
Oak st., Auburn to West River,-----	City,-----	2,025	-----	-----	387.75
Orchard st., George to Oak,-----	Chas. W. Blakeslee, day work,-----	1,070	-----	-----	526.87
Pierpont st., East Pearl to Ferry,-----	City,-----	855	-----	-----	260.75
Pine st., Ferry path to Ferry st.,-----	"-----	1,125	-----	-----	382.62
*Sherman ave., Whalley to Goffe,-----	"-----	1,246	3,132½	.3916	1,247.08
State st., Neck Bridge to Lyman st.,-----	Bernard Kivlehan,-----	3,810	4,988	.17	847.96
Union st., Wooster to Water,-----	City,-----	820	-----	-----	231.05
Tyler st., Oak to Alpine,-----	"-----	730	-----	-----	107.00
*View st., State st. northerly,-----	"-----	890	3,121½	.50	1,561.71
Wilson st., at Lamberton,-----	John Roach,-----	200	318	.10½	33.39

* Not complete.

STREET DEPARTMENT. STATEMENT No. 4.

Showing the Highest and Lowest Amounts of Bids for Street Grading.

STREET.	HIGHEST BID.		LOWEST BID.	
	Contractor.	Amount.	Contractor.	Amount.
Button,-----	Farnham & Thompson,-----	\$ 196.18	John Roach,-----	\$ 121.17
Canal,-----	F. F. Bishop,-----	2525.00	John P. Thompson,-----	2272.00
Carmel avenue,-----	Farnham & Thompson,-----	763.75	Charles W. Blakeslee,-----	602.19
Chapel,-----	James A. Davis,-----	1465.00	Patrick Leonard,-----	860.69
Cottage,-----	Farnham & Thompson,-----	64.32	James A. Davis,-----	46.23
County,-----	John Smith,-----	449.93	Chas. W. Blakeslee,-----	432.62
Crescent,-----	James A. Davis,-----	509.52	Chas. W. Blakeslee,-----	324.24
Edwards,-----	Thomas Kendle,-----	480.61	Patrick Rourke,-----	147.15
Foster,-----	Farnham & Thompson,-----	955.84	James A. Davis,-----	687.00
Greenwood,-----	Patrick Leonard,-----	418.49	Patrick Leonard,-----	418.49
Henry,-----	James A. Davis,-----	509.41	Chas. W. Blakeslee,-----	324.17
Humphrey,-----	Bernard Kivlehan,-----	1659.00	John Smith,-----	592.50
Lamberton,-----	Farnham & Thompson,-----	777.15	John Roach,-----	480.01
Morris,-----	Farnham & Thompson,-----	14.62	John Roach,-----	9.03
State,-----	Richard Connor,-----	1995.20	Bernard Kivlehan,-----	847.96
Wilson,-----	Farnham & Thompson,-----	54.06	John Roach,-----	33.39
		\$12,838.08		\$8,198.84

Difference in amounts, \$4,639.24.

STREET DEPARTMENT. STATEMENT No. 5.

Work on Sewers in 1874.

STREETS.	CONTRACTOR.	Length.	Size. Materials.	Cost of Sewer.	Cost of Manholes, Basins, &c.	Total Cost.
Argyle, -----	Canal st. west, -----	300.1	24 Bk.			\$1,473.54
Auburn -----	Cor. of Winthrop ave., -----	58.6	15 C.P.	\$ 93.76	\$ 293.19	386.95
Beers, -----	Chapel to Martin, -----	676.3	15 C.P.	1,014.45		
" -----	Martin to Elm, -----	442.9	15 C.P.	664.35	749.87	2,644.41
" -----	" -----	154.1	12 C.P.	215.74		
Bishop, -----	Cor. of State, -----	67.4	24 Bk.	178.61	49.77	228.38
Brown, -----	Water to Wooster, -----	482.6	15 C.P.	723.90	324.66	1,249.90
" -----	" -----	157.3	12 C.P.	201.34		
Broad, -----	Oak to George, -----	481.5	12 C.P.	553.73	502.20	1,055.93
*Canal, -----	Lock to Bristol, -----	610.8	60 Bk.	7,085.28		
* " -----	Bristol to Munson, -----	1847.8	54 Bk.	17,517.14		
* " -----	Munson to Argyle, -----	799.9	48 Bk.	6,389.10		
* " -----	Argyle to Division, -----	796.0	42 Bk.	6,766.00	7,975.32	46,748.34
* " -----	Cor. of Division, -----	40.4	36 Bk.	303.00		
* " -----	Cor. of Munson, -----	95.0	36 Bk.	712.50		
*Canner, -----	Anderson to Orange, -----	421.0	48 Bk.	3,157.50		
* " -----	" -----	810.0	42 Bk.	5,467.50		
* " -----	Orange to Whitney ave., -----	821.5	36 Bk.	4,929.00	3,462.80	17,223.80
* " -----	" -----	41.4	30 Bk.	207.00		
* " -----	Cor. of Whitney ave., -----	150.0	15 C.P.			736.08
Cedar, -----	Silver to Prince, -----	24.7	36 Bk.			265.81
Church, -----	Cor. of George, -----	138.3	12 C.P.			375.94
Court, -----	Artisan to Union, -----	54.6	42 Bk.	464.10	64.04	528.14
*Division, -----	Cor. of Canal, -----	58.5	24 Bk.	155.03	83.83	238.86
Edwards, -----	Cor. of State, -----	610.9	24 Bk.	1,160.71		
" -----	Orange to Whitney ave., -----	269.1	15 V.P.	484.38	2,005.68	4,049.70
" -----	" -----	287.0	12 V.P.	398.93		

* Commenced in 1873.

STREET DEPARTMENT. STATEMENT No. 5.—CONTINUED.

Work on Sewers in 1874.

STREETS.	CONTRACTOR.	Length.	Size. Materials.	Cost of Sewer.	Cost of Manholes, Basins, &c.	Total Cost.
Elm, ----- Cor. of Park, -----	Grandfield & Brennan, ---	110.1	15 C.P.	\$ 176.16	\$ 721.95	\$ 898.11
Evergreen Cem., -----	City, -----	32.0	24 C.P.			99.70
Greene, ----- Franklin to Chestnut, -----	" -----	130.0	24 Bk.			
" ----- Chestnut to Wooster pl., -----	" -----	340.7	24 Bk.			
" ----- Wooster pl. to Hughes pl., -----	" -----	369.2	18 C.P.			3,961.46
Hamilton pl., ----- Locust to Myrtle, -----	Matthew Kehoe, -----	234.0	15 V.P.			
Hamilton st., ----- Humphrey to State, -----	Davis & Fowler, -----	411.6	12 C.P.	511.41	148.05	659.46
" ----- " -----	" -----	57.4	30 Bk.	171.05	181.31	600.14
" ----- Greene to St. John, -----	" -----	93.5	24 Bk.	247.78		
" ----- " -----	Peter Trainer, -----	30.1	15 V.P.	70.74	248.91	810.45
Howard ave., ----- Davenport ave to Park st., -----	Davis & Fowler, -----	327.2	12 V.P.	490.80		
" ----- Park to South, -----	" -----	453.5	15 C.P.	612.23	744.66	1,526.98
*Humphrey, ----- Cor. of Whitney ave., -----	William Grandfield, -----	147.9	12 C.P.	170.09		
*" ----- " -----	" -----	22.4	24 Bk.	112.00	246.46	433.46
Jefferson, ----- St. John to Grand, -----	" -----	30.0	15 V.P.	75.00		
" ----- Grand to Lyon, -----	Davis & Fowler, -----	414.4	24 Bk.	1,243.20	777.25	2,846.43
*Lock, ----- Prospect to Canal, -----	Peter Trainer, -----	367.1	18 C.P.	825.98		
Lyon, ----- Jefferson to Olive, -----	Davis & Fowler, -----	473.5	60 Bk.	5,492.60	1,251.35	6,743.95
" ----- " -----	" -----	378.3	15 C.P.	718.77		
Mansfield, ----- Lock to Sachem, -----	Trainer & McCabe, -----	346.9	12 C.P.	346.9	550.88	1,772.65
" ----- Sachem to Compton, -----	" -----	428.0	30Bk. 8in.	1,840.40		
" ----- " -----	" -----	49.2	24 " 4in.	196.80	1,171.85	5,366.05
Meadow, ----- Water to Whiting, -----	Davis & Fowler, -----	719.0	24 " 4in.	2,157.00		
" ----- Whiting to George, -----	" -----	620.6	36 Bk.	2,172.10		
" ----- " -----	" -----	699.3	30Bk. 8in.	2,272.73	1,523.58	5,968.41

STREET DEPARTMENT. STATEMENT No. 5.—CONTINUED.

Work on Sewers in 1874.

STREETS.	CONTRACTOR.	Length.	Size. Materials.	Cost of Sewer.	Cost of Manholes, Basins, &c.	Total Cost.
*Munson, ---- Canal to Canal, ----	Peter Trainer, ----	62.7	54 Bk.	\$ 594.40 }	\$ 398.79	\$1,940.89
* " " " " " " " " " " " "	" " " " " " " " " " " "	105.3	48 Bk.	947.70 }		2,019.70
New street, --- In front of Depot, ----	Grandfield & Brennan, ---	275.7	24 Bk.	1,778.27	241.43	1,373.86
Park, ----- Martin to Elm, ----	" " " " " " " " " " " "	527.4	24 Bk.	1,054.80	319.06	1,74.96
*Pearl (extens.) Cor. of Whitney ave., ----	William Grandfield, ----	47.0	15 V.P.	117.50	57.46	193.51
*Sachem, ----- " " " " " " " " " " " "	" " " " " " " " " " " "	53.6	15 V.P.	134.00	59.51	
State, ----- Humphrey to Hamilton, ----	Davis & Fowler, ----	103.0	12 C.P.	149.35		
" " " " " " " " " " " "	" " " " " " " " " " " "	276.2	24 Bk.	731.93		
" " " " " " " " " " " "	" " " " " " " " " " " "	197.4	24 Bk.	523.11	865.12	2,939.71
" " " " " " " " " " " "	" " " " " " " " " " " "	217.5	15 C.P.	380.63		
" " " " " " " " " " " "	" " " " " " " " " " " "	199.7	12 C.P.	289.57		
Sylvan ave., --- Cor. of Winthrop ave., ----	Grandfield & Brennan, ----	58.0	24 Bk.	116.00	323.43	439.43
Temple, ----- Cor. of Trumbull, ----	Davis & Fowler, ----	44.3	20 Bk.	99.68		
" " " " " " " " " " " "	" " " " " " " " " " " "	257.0	15 C.P.	372.65	446.85	1,128.43
" " " " " " " " " " " "	" " " " " " " " " " " "	167.4	12 C.P.	209.25		
Water, ----- Hill to Lafayette, ----	Laurence O'Brien, ----	470.7	15 C.P.	564.84	558.05	1,122.89
Winthrop ave., Sylvan ave. south, ----	Grandfield & Brennan, ----	460.5	24 Bk.	921.00	520.52	1,441.52
*Whitney ave., Bradley to Humphrey, ----	William Grandfield, ----	1370.0	15 V.P.	3,425.00		
* " " " " " " " " " " " "	" " " " " " " " " " " "	231.9	15 V.P.	579.75	2,666.98	7,355.81
* " " " " " " " " " " " "	" " " " " " " " " " " "	390.9	12 V.P.	684.08		
" " " " " " " " " " " "	Grandfield & Brennan, ----	37.3	30 Bk.	186.50		
" " " " " " " " " " " "	" " " " " " " " " " " "	964.9	24 Bk.	3,859.60	3,403.90	10,547.50
" " " " " " " " " " " "	" " " " " " " " " " " "	596.5	15 V.P.	1,789.50		
" " " " " " " " " " " "	" " " " " " " " " " " "	327.0	24 Bk.	1,308.00		

*Commenced in 1873.

STREET DEPARTMENT. STATEMENT No. 6.
Sewer Contracts completed in 1874.

52

STREETS.	Size and Material.	Average Cut.	Length.	Nature of Excavation.	Contract Price Per Foot.
Canal, -----	60 in. Brick.	12.8	610.8	Sand and Water, -----	\$11.60
Lock, -----	60 "	12.5	473.5	Sand, Quicks'd and Water, -----	11.60
Canal, -----	60 "	11.8	1,847.8	Sand, Hardpan and Water, -----	9.48
Munson, -----	54 "	16.0	62.7	Sand and Water, -----	9.48
Canal, -----	54 "	13.7	709.9	" " -----	9.00
Munson to Argyle, -----	48 "	13.0	421.0	Gravel and Sand, -----	7.50
Canner, -----	48 "	14.2	105.3	Sand and Water, -----	9.00
Munson, -----	48 "	12.9	796.0	Sand, Rock and Water, -----	8.00
Canal, -----	42 "	14.0	810.0	Sand, Gravel and Water, -----	6.75
Canner, -----	42 "	12.0	54.6	Sand and Water, -----	8.00
Division, -----	42 "	11.5	40.4	" " -----	7.50
Canal, -----	36 "	9.0	95.0	Sand, loose Stone & Water, -----	7.50
" -----	36 "	10.8	821.5	Gravel, Quicks'd & Water, -----	6.00
Canner, -----	36 "	9.5	24.7	Sand, -----	Built by City.
Church, -----	36 "	13.2	620.6	Sand, Quicks'd and Water, -----	3.50
Meadow, -----	36 "	11.0	41.4	Sand and Water, -----	5.00
Canner, -----	30 "	15.4	57.4	Sand and Gravel, -----	2.98
Hamilton, -----	30 "	11.0	37.3	Sand and Water, -----	5.00
Whitney ave., -----	30 "	12.7	42.8	Sand, Quicks'd and Water, -----	4.50
Cor. of Canner, -----	30 in. Brick, 8 in. Invert, -----	11.3	699.3	" " -----	3.25
Mansfield, -----	30 " " -----	10.5	300.1	Sand and Water, -----	Built by City.
Argyle, -----	24 in. Brick, -----	11.5	67.4	Sand and Gravel, -----	2.65
Bishop, -----	24 " -----	11.7	58.5	" " -----	2.95
Edwards, -----	24 " -----	9.8	610.9	Sand, -----	1.90
" -----	24 " -----	4.0	130.0	" " -----	Built by City.
Evergreen Cemetery, -----	24 " -----				

STREET DEPARTMENT. STATEMENT No. 6.—CONTINUED.

Sewer Contracts completed in 1874.

53

STREETS.	Size and Material.	Average Cut.	Length.	Nature of Excavation.	Contract Price Per Foot.
Greene, -----	Franklin to Chestnut, 24 in. Brick, -----	11.4	340.7	Sand, -----	Built by City.
Hamilton, -----	Humphrey to State, 24 " -----	14.3	93.5	Gravel and Sand, -----	2.65
Humphrey, -----	Cor. of Whitney ave., 24 " -----	10.5	22.4	Rock, -----	5.00
Jefferson, -----	St. John to Grand, 24 " -----	13.3	414.4	Sand, -----	3.00
Mansfield, -----	Sachem to Compton, 24 in. Brick, 8 in. Invert, -----	14.6	49.2	Sand and Water, -----	4.00
" -----	" 4 " -----	11.8	719.0	Sand and Hardpan, -----	3.00
New st. in front of Depot, -----	Pile foundation, 24 " -----	5.6	275.7	Sand and Water, -----	6.45
Park, -----	Martin to Elm, 24 " -----	13.9	527.4	Sand, -----	2.00
State, -----	Hamilton to Bishop, 24 " -----	13.6	276.2	Sand and Gravel, -----	2.65
" -----	East to Edwards, 24 " -----	11.9	197.4	" -----	2.65
Sylvan ave., -----	Cor. of Winthrop ave., 24 " -----	13.8	58.0	Sand, -----	2.00
Winthrop ave., -----	Sylvan ave. South, 24 " -----	12.3	460.5	" -----	2.00
Whitney ave., -----	Canner to Lawrence, 24 " -----	10.5	964.9	Sand, Rock and Water, -----	4.00
" -----	Lawrence to Edwards, 24 " -----	10.4	327.0	" -----	4.00
Evergreen Cemetery, -----	24 in. Cement pipe, -----	4.0	32.0	Sand, -----	Built by City.
Temple, -----	Cor. of Trumbull, 20 in. Brick, -----	11.8	44.3	Sand and Gravel, -----	2.25
Greene, -----	Chestnut to Wooster pl., 18 in. Cement pipe, -----	10.8	369.2	Sand, -----	Built by City.
Jefferson, -----	Grand to Lyon, 18 " -----	12.3	367.1	" -----	2.25
Auburn, -----	Cor. of Winthrop ave., 15 " -----	12.8	58.6	" -----	1.60
Beers, -----	Chapel to Elm, 15 " -----	12.7	1,119.2	" -----	1.50
Brown, -----	Water to Wooster, 15 " -----	10.5	482.6	" -----	1.50
Cedar, -----	Silver to Prince, 15 " -----	12.5	150.0	Sand and Loam, -----	Built by City.
Elm, -----	Cor. of Park, 15 " -----	12.5	110.1	Sand, -----	1.60
Howard ave., -----	Davenport ave. to Park st., 15 " -----	10.7	453.5	" -----	1.35
Lyon, -----	Jefferson to Olive, 15 " -----	11.0	378.3	" -----	1.90

NOTE.—The sum of \$3.00 per cubic yard was allowed for rock.

STREET DEPARTMENT. STATEMENT No. 6.—CONTINUED.

Sewer Contracts completed in 1874.

STREETS.	Size and Material.	Average Cut.	Length.	Nature of Excavation.	Contract Price Per Foot.
State, -----	15 in. Cement pipe, -----	11.0	217.5	Sand and Gravel, -----	\$1.75
Temple, -----	" " -----	10.5	257.0	" " -----	1.45
Water, -----	" " -----	5.8	470.7	Loam and Water, -----	1.20
Edwards, -----	15 in. Vitrified pipe, -----	11.1	269.1	Sand, Rock and Water, --	1.80
Greene, -----	Wooster pl. to Hughes pl., 15	9.9	234.0	Sand, -----	Built by City.
Hamilton, -----	" " -----	13.3	30.1	" " -----	2.35
Humphrey, -----	Cor. of Greene, -----	10.5	30.0	Rock, -----	2.50
Pearl, extension of " " -----	" " -----	10.0	47.0	Sand, -----	2.50
Sachem, -----	" " -----	10.7	53.6	Sand and Gravel, -----	2.50
Whitney ave., -----	" " -----	10.5	1,601.9	Sand, Rock and Water, --	2.50
" " -----	" " -----	9.6	596.5	" " -----	3.00
Beers, -----	12 in. Cement pipe, -----	10.3	154.1	Sand, -----	1.40
Brown, -----	Martin to Elm, -----	9.9	157.3	" " -----	1.28
Broad, -----	Water to Wooster, -----	10.1	481.5	Loam, Quicks'd & Water, --	1.15
Court, -----	Oak to George, -----	9.3	138.3	Gravel, -----	Built by City.
Hamilton place, -----	Artisan to Union, -----	11.4	411.6	Loam, Gravel and Sand, --	1.2425
Howard ave., -----	Locust to Myrtle, -----	9.8	147.9	Sand, -----	1.15
Lyon, -----	Park to Sylvan ave., -----	9.9	346.9	" " -----	1.45
State, -----	Jefferson to Olive, -----	11.9	103.0	Sand and Gravel, -----	1.45
" " -----	Humphrey to Hamilton, --	10.4	199.7	Sand, -----	1.45
Temple, -----	Edwards to Bishop, -----	10.9	167.4	Sand and Gravel, -----	1.25
Edwards, -----	Trumbull to R. R. Bridge, 12	10.1	287.0	Sand, Rock and Water, --	1.39
Hamilton, -----	Orange to Whitney ave., --	11.2	327.2	Sand, -----	1.50
Whitney ave., -----	Greene to St. John, -----	9.1	390.9	Sand, Rock and Water, --	1.75
	Whitney ave., -----				

NOTE.—The sum of \$3.00 per cubic yard was allowed for rock.

STREET DEPARTMENT. STATEMENT No. 7.

Average of the Contract Prices per foot of each of the respective sizes of
Sewer built during 1874.

Size.	Material.	Average Contract Price per Foot.
48 inches.	Brick.	\$9.00
42 "	"	8.89
36 "	"	4.99
30 "	"	4.15
30 "	Brick, 8 in. Invert.	3.65
24 "	Brick.	2.87
20 "	"	2.25
18 "	Cement Pipe.	2.25
15 "	" "	1.50
12 "	" "	1.29
15 "	Vitrified Pipe.	2.62
12 "	" "	1.45

STREET DEPARTMENT. STATEMENT No. 8.

Comparison of Bids on Sewers according to estimate of quantities.

Location of Sewers.	HIGHEST BIDDER.	Amount.	LOWEST BIDDER.	Amount.	Difference.
Beers, Chapel to Elm,-----	Grandfield & Brennan,---	\$2,805.50	Michael Fitzpatrick,-----	\$2,434.00	\$ 371.50
Broad, Oak to George,-----	Laurence O'Brien,-----	1,098.00	Davis & Fowler,-----	927.50	170.50
Brown, Water to Wooster,-----	Matthew Kehoe,-----	1,980.90	Laurence O'Brien,-----	1,175.80	805.10
Edwards, Orange to Whitney ave.,-----	William Grandfield,-----	3,266.00	"-----	2,743.20	522.80
Hamilton place, Locust to Myrtle,-----	Laurence O'Brien,-----	691.00	Matthew Kehoe,-----	627.50	63.50
Hamilton and State, Humphrey to East,-----	Grandfield & Brennan,---	4,604.50	Davis & Fowler,-----	3,652.00	952.50
Hamilton, Greene to St. John,-----	Matthew Kehoe,-----	1,238.00	Trainer & McCabe,-----	718.50	519.50
Howard ave., Davenport to Sylvan ave.,-----	Grandfield & Brennan,---	1,614.00	Davis & Fowler,-----	1,342.00	272.00
Jefferson & Lyon, St. John to Olive,-----	Michael Fitzpatrick,-----	4,211.75	Wm. E. Davis,-----	3,401.00	810.75
Mansfield, Lock to Compton,-----	"-----	6,414.50	Trainer & McCabe,-----	4,439.20	1,975.30
Meadow, Water to George,-----	"-----	6,812.00	Davis & Fowler,-----	4,412.00	2,400.00
New street in front of Depot,-----	Davis & Fowler,-----	2,033.50	Grandfield & Brennan,---	1,801.50	232.00
Park, Martin to Elm,-----	Matthew Kehoe,-----	2,183.00	"-----	1,924.00	259.00
Temple, Trumbull to R. R. bridge,-----	Grandfield & Brennan,---	1,302.00	Davis & Fowler,-----	995.50	306.50
Water, Hill to Lafayette,-----	Davis & Fowler,-----	1,408.00	Laurence O'Brien,-----	1,133.00	275.00
Winthrop ave., Sylvan ave. south,-----	"-----	2,003.50	Grandfield & Brennan,---	1,785.00	218.50
		\$43,666.15		\$33,511.70	\$10,154.45

STREET DEPARTMENT. STATEMENT No. 9.

Showing Work on Bridges during 1874.

LOCALITY.	Work Done.	Cost.
Barnesville Bridge, over Mill River, -----	Work on Causeway,-----	\$ 602.85
Chapel street Bridge, " -----	Repairing East Abutment, -----	3,192.00
" " " -----	Moving Bridge Tender House to west side of channel,--	521.69
" " " -----	Salary of Bridge Tender,-----	720.00
Ferry street Bridge, -----	Changing Southwest Wing Wall,-----	173.40
Quinnipiac Bridge, over Quinnipiac River, -----	New Planking,-----	2,526.73
Henry street Bridge, over Beaver Creek, -----	-----	78.84
		\$7,815.51

STREET DEPARTMENT. STATEMENT No. 10.

Showing Repairs on Street Pavements during 1874.

STREETS.	Between what Points.	Material.	Work Done.	Cost.
Broadway, -----	Between Horse R. R. tracks, -----	Belgian, -----	New, -----	\$1,019.20
Church, -----	" " Elm to Chapel, -----	" -----	" -----	2,429.66
Chapel, -----	Church and York streets, -----	Wood, -----	Repairs, -----	796.09
" -----	York and Howe streets, -----	Telford, -----	" -----	353.71
" -----	Church and State streets, -----	Belgian, -----	" -----	50.50
Crown, -----	Temple and York streets, -----	Telford, -----	" -----	1,249.08
" -----	State and Orange streets, -----	" -----	" -----	338.53
" -----	Church and Temple streets, -----	Wood, -----	" -----	384.63
Custom House Square, -----	Temple and High, -----	Belgian, -----	" -----	58.00
Elm, -----	State and Temple (including Belgian blocks bet. tracks), -----	Telford, -----	" -----	1,175.49
" -----	Near Jefferson, -----	" -----	" -----	5,010.73
Grand, -----	State street to R. R. bridge, -----	Belgian, -----	" -----	12.00
" -----	East street to Olive street, -----	" -----	" -----	291.30
Wooster, -----	Whalley ave., -----	Telford, -----	" -----	3,987.70
				201.00
				\$17,357.62

STREET DEPARTMENT. STATEMENT No. II.

Showing Streets Turnpiked during 1874.

Streets.	Between what points.	Cost.
Adeline, ...	Eddy to Barclay, ...	\$ 10.25
Asylum, ...	Oak to Davenport av., ...	34.60
Arthur, ...	Rosette to Lamberton, ...	70.50
Bradley, ...	William to Grand, ...	30.00
Blatchley av., ...	Chapel to River, 7th Ward, ...	37.50
Beers, ...	Elm to Martin, ...	22.50
Button, ...	Rosette to Lamberton, ...	15.00
Brewster, ...	Shelton av. to Dixwell av., ...	22.50
Congress av., ...	Near West river, ...	68.25
Crown, ...	Park to Howe, ...	30.00
Canal, ...	Lock to Webster, ...	299.00
Chestnut, ...	St. John to Chapel, ...	35.00
Columbus, ...	Near West river, ...	268.75
Crescent, ...	Goffe to City line, ...	133.75
Carlisle, ...	Water to Cedar, ...	25.00
Cold Spring, ...	Whitney av. to Orange, ...	632.50
Castle, ...	Main to Monroe, 7th Ward, ...	10.50
Clay, ...	Poplar to Ferry, 7th Ward, ...	14.00
Dixwell av., ...	Monson to City line, ...	403.00
Davenport av., ...	Oak to West river, ...	177.50
Daggett, ...	Congress av. to Washington st., ...	107.75
Dewitt, ...	Washington to Rosette st., ...	36.50
Dickerman, ...	Sperry to Orchard, ...	15.00
East, ...	Laurel to State, ...	51.50
Elm, ...	Garden to Sherman av., ...	85.00
Edwards, ...	Foster to Orange, ...	20.50
Elliott, ...	George to Gilbert av., ...	82.00
Foote, ...	Dixwell av. to Ashmun, ...	98.88
Fair, ...	Union to Olive, ...	43.50
Frank, ...	Columbus to West, ...	98.00
Fillmore, ...	Grand to Pine, 7th Ward, ...	22.50
Ferry, ...	Grand to Middletown av., 7th Ward, ...	117.58
Ferry path, ...	Monroe to R. R. crossing, 7th Ward, ...	119.00
Goffe, ...	Punderson to Crescent, ...	56.25
Greenwich av., ...	Second to Fourth, ...	85.00
Hamilton, ...	State to Walnut, ...	15.00
Howard av., ...	Davenport av. to Sylvan av., ...	40.00
Hudson, ...	Whalley av. to Goffe, ...	83.50
Henry, ...	Dixwell av. to Orchard, ...	38.15
Hallock, ...	Congress av. to Washington, ...	77.75
Hotchkiss, ...	Chapel to Martin, ...	45.00
Hazel, ...	Shelton av. to Canal, ...	59.75
James, ...	Chapel to Grand, 7th Ward, ...	186.75

Streets.	Between what points.	Cost.
Kimberly av., ...	Howard av. to West river, ...	\$ 75.25
Lyon, ...	Olive to Bradley, ...	111.50
Locust, ...	Hamilton to East, ...	12.25
Laurel, ...	State to East, ...	61.50
Liberty, ...	Prince to Washington, ...	15.00
Lloyd, ...	Chapel to Grand, 7th Ward, ...	30.00
Martin, ...	Park to Howe, ...	15.00
Mill River, ...	Near State, ...	15.00
Market, ...	James to Ferry path, 7th Ward, ...	30.00
Main, ...	Market to Shore Line R. R., 7th Ward, ...	95.00
Monroe, ...	Ferry path to Shore Line R. R., 7th "	7.00
Middletown av., ...	Clinton av. to Lewis Bridge, 7th "	69.00
Newhall, ...	Argyle to Division, ...	45.00
Oak, ...	Greenwood to West river, ...	114.00
Orchard, ...	Chapel to Oak, ...	187.87
Prospect, ...	Sachem to City line, ...	1,213.35
Pleasant, ...	Clark to Pearl, ...	1.75
Park, ...	Elm to Chapel, ...	42.50
Punderson, ...	Whalley av. to Goffe, ...	95.00
Pearl (East), ...	South Front to Grand, 7th Ward, ...	33.75
Poplar, ...	Clay to Grand, 7th Ward, ...	35.00
Perkins, ...	Pine to Grand, 7th Ward, ...	11.25
Redfield, ...	Columbus to Congress av., ...	22.50
Rosette, ...	Howard av. to Morris, ...	53.00
Silver, ...	Hill to Liberty, ...	38.25
Summer, ...	State to Franklin, ...	7.50
Sherman av., ...	Winthrop av. to Whalley av., ...	557.50
State, ...	Humphrey to Neck Bridge, ...	159.00
Sylvan av., ...	Winthrop av. to Vine, ...	35.50
Shelton av., ...	Ivy to R. R. crossing, ...	10.50
Spring, ...	Washington to R. R., ...	341.75
Spruce, ...	George to Oak, ...	22.50
South, ...	York to Howard ave., ...	80.25
Saltonstall, ...	Ferry to Blatchley av., 7th Ward, ...	155.00
Thompson, ...	Division to Canal, ...	93.00
Tyler, ...	Oak st., southerly, ...	7.50
Vine, ...	Sylvan av. to Oak, ...	10.50
Veto, ...	Orange to State, ...	7.50
West Water, ...	State to Carlisle, ...	110.00
Winthrop av., ...	Gilbert to Chapel, ...	135.12
Ward, ...	Congress av. to Sylvan av., ...	90.00
Walnut, ...	Hamilton to East	45.00
Wolcott, ...	James to Poplar, 7th Ward, ...	147.75
West, ...	Columbus to Derby R. R., ...	28.00
William, ...	Olive to Bradley, ...	21.00
Willow, ...	Nicoll to Mill river, ...	178.50
York, ...	Davenport av. to Oak, ...	22.50

 \$8,620.55

STREET DEPARTMENT. STATEMENT No. 12.

Showing Streets Top-Dressed with Crushed Stone during 1874.

Streets.	Between what points.	Cost.
Academy, ...	Chapel to Green, ...	\$133.00
College, ...	Elm to Chapel, ...	42.50
Home place, ...	Academy to Olive, ...	63.50
Temple, ...	Chapel to Elm, ...	443.00
Temple, ...	Elm to Grove, ...	94.25
York, ...	Elm to Grove, ...	177.75
		<u>\$954.00</u>

STREET DEPARTMENT. STATEMENT No. 13.

Showing Streets Top-Dressed with Oyster Shells during 1874.

Streets.	Between what points.	Cost.
Chapel (East), ...	Mill river to Ferry, 7th Ward, ...	\$910.15
Exchange, ...	7th Ward, ...	33.70
Front (South), ...	7th Ward, ...	50.60
Grand (East), ...	Mill river to Quinnipiac river, ...	1,329.35
Howard av., ...		583.50
Kimberly av., ...		40.60
Pearl (East), ...	7th Ward, ...	35.90
Pine, ...	7th Ward, ...	27.50
Third, ...	7th Ward, ...	66.90
		<u>\$3,078.20</u>

STREET DEPARTMENT. STATEMENT No. 14.

Showing Crosswalks laid during 1874.

Streets.	Location.	Side.
Asylum, ...	Across Davenport av., ...	West.
Asylum, ...	Across Congress av., ...	East.
Asylum, ...	Across Sylvan av.	West.
Bristol, ...	Across Ashmun, ...	South.
Blatchley av., ...	Across Grand, 7th Ward, ...	West.
Cedar, ...	Across Washington, ...	West.
Columbus, ...	Across Redfield, ...	North.
Columbus, ...	Across Bond, ...	North.
Columbus, ...	Across West, ...	North.
Columbus, ...	Across Hedge, ...	North.
Columbus, ...	Across White, ...	North.
Clay, ...	Across Ferry, 7th Ward, ...	North.
Clay, ...	Across Ferry, 7th Ward, ...	South.
Chestnut, ...	Across Greene, ...	East.
Congress av., ...	Across Asylum, ...	North.
Charles, ...	Across Orchard, ...	North.
Chapel, ...	Across Gregson, ...	South.
Chapel, ...	Across Houston, 7th Ward, ...	North.
Chapel, ...	Across Ferry, 7th Ward, ...	North.
Chapel, ...	Across Poplar, 7th Ward, ...	North.
Chapel, ...	Across James, 7th Ward, ...	North.
Chapel, ...	Across Blatchley av., 7th Ward, ...	North.
Chapel, ...	Across Lloyd, 7th Ward, ...	North.
Clinton av., ...	Across Grand, 7th Ward, ...	East.
Clinton av., ...	Across Chatham, 7th Ward, ...	East.
Clinton av., ...	Across Peck, 7th Ward, ...	East.
Clinton av., ...	Across English, 7th Ward, ...	East.
Clinton av., ...	Across Lombard, 7th Ward, ...	East.
Clinton av., ...	Across Dover, 7th Ward, ...	East.
Clinton av., ...	Across Bailey, 7th Ward, ...	East.
Castle, ...	Across Main, 7th Ward, ...	South.
Dixwell av., ...	Across Eaton, ...	East.
Dixwell av., ...	Across Foote, ...	West.
Davenport av., ...	Across Asylum, ...	South.
Day, ...	Across Martin, ...	East.
Day, ...	Across George, ...	East.
Day, ...	Across Orchard, ...	East.
Day, ...	Across Orchard, ...	West.
Dewitt, ...	Across Portsea, ...	East.
Dewitt, ...	Across Portsea, ...	West.
Dewitt, ...	Across Putnam, ...	East.
Dewitt, ...	Across Putnam, ...	West.
Dewitt, ...	Across Spring, ...	East.
Dewitt, ...	Across Spring, ...	West.

Streets.	Location.	Side.
Dewitt, ...	Across Carlisle, ...	West.
Elliott, ...	Across Sylvan av., ...	West.
Elliott, ...	Across Sylvan av.	East.
Elm, ...	Across Orchard, ...	South.
Exchange, ...	Across East Pearl, 7th Ward, ...	North.
Exchange, ...	Across Lloyd, 7th Ward, ...	North.
Exchange, ...	Across Lloyd, 7th Ward, ...	South.
Ferry, ...	Across Chatham, 7th Ward, ...	West.
Ferry, ...	Across Lombard, 7th Ward, ...	West.
Ferry, ...	Across Peck, 7th Ward, ...	West.
Franklin, ...	Opposite No. 185.	
Gregory, ...	Across Dixwell av., ...	South.
Greene, ...	Across Chestnut, ...	North.
George, ...	Across Day, ...	North.
George, ...	Across Orchard, ...	North.
George, ...	Across Sherman av., ...	North.
Gilbert, ...	Across Orchard, ...	South.
Goffe, ...	Across Orchard, ...	South.
Gill, ...	Across Martin, ...	West.
Greenwood, ...	Across Sylvan av., ...	West.
Greenwood, ...	Across Oak, ...	East.
Halleck, ...	Across Congress av., ...	East.
Howard av., ...	Across Park, ...	East.
Howard av., ...	Across South, ...	East.
Howard av., ...	Across Oak, ...	East.
Hamilton place, ...	Across Myrtle, ...	East.
Hamilton place, ...	Across Locust, ...	East.
Hillhouse av., ...	Across Grove, ...	East.
Hillhouse av., ...	Across Grove, ...	West.
Hotchkiss, ...	Across Chapel, ...	West.
Hamilton, ...	Across Laurel, ...	East.
Howard av., ...	Across Gilbert, ...	East.
Jackson, ...	Across Pine, 7th Ward, ...	West.
Jackson, ...	Across Clay, 7th Ward, ...	West.
Jackson, ...	Across Clay, 7th Ward, ...	East.
Jackson, ...	Across Ferry path, 7th Ward, ...	West.
James, ...	Across Clay, 7th Ward, ...	West.
Kensington, ...	Across Martin, ...	East.
Kimberly av., ...	Across Greenwich av., ...	West.
Kimberly av., ...	Across Grant, ...	West.
Lock, ...	Across Mansfield, ...	North.
Lyon, ...	Between Jefferson and Olive,	
Liberty, ...	Across Prince, ...	West.
Locust, ...	Across Hamilton, ...	North.
Lombard, ...	Across Ferry, 7th Ward, ...	South.
Lloyd, ...	Across Exchange, 7th Ward, ...	East.
Lloyd, ...	Across Exchange, 7th Ward, ...	West.
Market, ...	Across James, 7th Ward, ...	South.
Market, ...	Across Main, 7th Ward, ...	North.

Streets.	Location.	Side.
Main, ...	Across Market, 7th Ward, ...	West.
Main, ...	Across Castle, 7th Ward, ...	West.
Main, ...	Across Castle, 7th Ward, ...	East.
Mansfield, ...	Across Sachem, ...	East.
Martin, ...	Across Orchard, ...	North.
Martin, ...	Across Kensington, ...	North.
Morris, ...	Across Rosette, ...	East.
Myrtle, ...	Across Wallace, ...	South.
Oak, ...	Across Greenwood, ...	North.
Oak, ...	Across Greenwood, ...	South.
Oak, ...	Across Ward, ...	South.
Orange, ...	Across Lawrence, ...	East.
Orchard, ...	Across George, ...	East.
Orchard, ...	Across George, ...	West.
Orchard, ...	Across Gilbert, ...	East.
Orchard, ...	Across Martin, ...	East.
Orchard, ...	Across Elm, ...	East.
Orchard, ...	Across Sylvan av., ...	East.
Pleasant, ...	Across Clark, ...	East.
Putnam, ...	Across Dewitt, ...	North.
Prince, ...	Across Liberty, ...	North.
Poplar, ...	Across Woolsey, 7th Ward, ...	East.
Pine, ...	Across Jackson, 7th Ward, ...	South.
Rosette, ...	Across Dewitt, ...	North.
Rosette, ...	Across Hurlburt, ...	South.
Rosette, ...	Across Wilson, ...	South.
St. John, ...	Across Chestnut, ...	South.
Spring, ...	Across Liberty, ...	North.
South, ...	Opposite the Convent.	
Sylvan av., ...	Across Howard av., ...	North.
Sylvan av., ...	Across Howard av., ...	South.
Sylvan av., ...	Across Asylum, ...	North.
Sylvan av., ...	Across Orchard, ...	North.
Sylvan av., ...	Across Vine, ...	North.
Sylvan av., ...	Across Greenwood, ...	North.
Sylvan av., ...	Across Auburn, ...	North.
Sylvan av., ...	Across Winthrop av., ...	North.
Temple, ...	Across Chapel, ...	West.
Vernon, ...	Across Sylvan av., ...	East.
Vine, ...	Across Sylvan av., ...	West.
Ward, ...	Across Davenport av., ...	East.
West Water, ...	Across Hill, ...	North.
Washington, ...	Across Dewitt, ...	South.
Whalley av., ...	Across Sherman av., ...	North.
Whalley av., ...	Across Carmel av., ...	North.
Wooster, ...	Across State, ...	South.
Woolsey, ...	Across Blatchley av., 7th Ward, ...	North.
Woolsey, ...	Across Blatchley av., 7th Ward, ...	South.
Wolcott, ...	Across Blatchley av., 7th Ward, ...	North.

STREET DEPARTMENT. STATEMENT No. 15.

Showing Sidewalks Completed during 1874.

Streets.	Between what points.	Side.	Material.
Asylum, . .	Davenport av. to Congress av.,	Both.	Brick.
Baldwin, . .	Davenport av. to Congress av.,	East.	Brick.
Blatchley av., .	Grand to Clay, ...	East.	Concrete.
Bradley, . .	No. 69 to State, ...	North.	Brick relay.
Broadway parks, ...			Concrete.
Canal, . . .	Webster to Lock, ...	West.	Concrete.
Chapel, . . .	Olive to Union, ...	South.	Flag.
Chapel, . . .	Norton to Winthrop av., . .	South.	Curb.
Clinton av., .	Pine to Middletown av., . .	West.	Concrete.
Cottage, . . .	Foster to Orange, ...	South.	Curb.
Court, . . .	State to Olive, ...	Both.	Brick relay.
Davenport av.,	West to Congress av., . . .	South.	Curb.
Derby av., . .	George to Winthrop av., . .	Both.	Curb.
Dewitt, . . .	Columbus to Rosette, ...	Both.	Brick.
Dickerman, . .	Sperry to Orchard, ...	South.	Concrete.
Chapel (East),	Chapel st. Bridge to East Pearl,	Both.	Curb.
Chapel (East),	East to Ferry, ...	North.	Concrete.
Elm, ...	Austin's property to College, .	North.	Brick relay.
Elm, ...	Norton to Winthrop av., . .	North.	Curb.
Exchange, . .	James to South Front, ...	Both.	Concrete.
Foote, ...	Ashmun to Dixwell av., . . .	North.	Curb.
Foote, ...	Ashmun to Dixwell av., . . .	North.	Brick.
Foote, ...	Winter to Dixwell av., . . .	South.	Curb.
Frank, ...	West to Columbus, ...	Both.	Curb.
Gilbert av., .	Greenwood to Elliott, ...	South.	Brick.
Hallock, . . .	Columbus to Congress av., . .	Both.	Brick.
Hamilton, . .	Locust to Myrtle, ...	East.	Concrete.
High, ...	Elm to Wall, ...	West.	Brick relay.
Howard av., .	Oak to Davenport av., ...	East.	Brick.
Hudson, . . .	Goffe to Whalley av., ...	Both.	Brick.
Jackson, . . .	Clay to Shore L. R. R. crossing,	East.	Curb.
Lafayette, . .	Rose to Broad, ...	South.	Brick.
Lafayette, . .	Silver to Columbus, ...	West.	Brick.
Laurel, . . .	Wallace to Hamilton, ...	North.	Concrete.
Lewis, ...	North Front to Pine, ...	West.	Concrete.
Locust, . . .	East to Hamilton, ...	South.	Brick.
Lyon, ...	Olive to Bradley, ...	Both.	Brick relay.
Main, ...	Market to Alton, ...	Both.	Concrete.
Mansfield, . .	No. 27 to Sachem, ...	East.	Flag.
Market, . . .	James to Ferry, ...	South.	Concrete.
Martin, . . .	Orchard to Sherman av., . . .	South.	Flag & Concrete.
Martin, . . .	Garden to Beers, ...	North.	Brick.

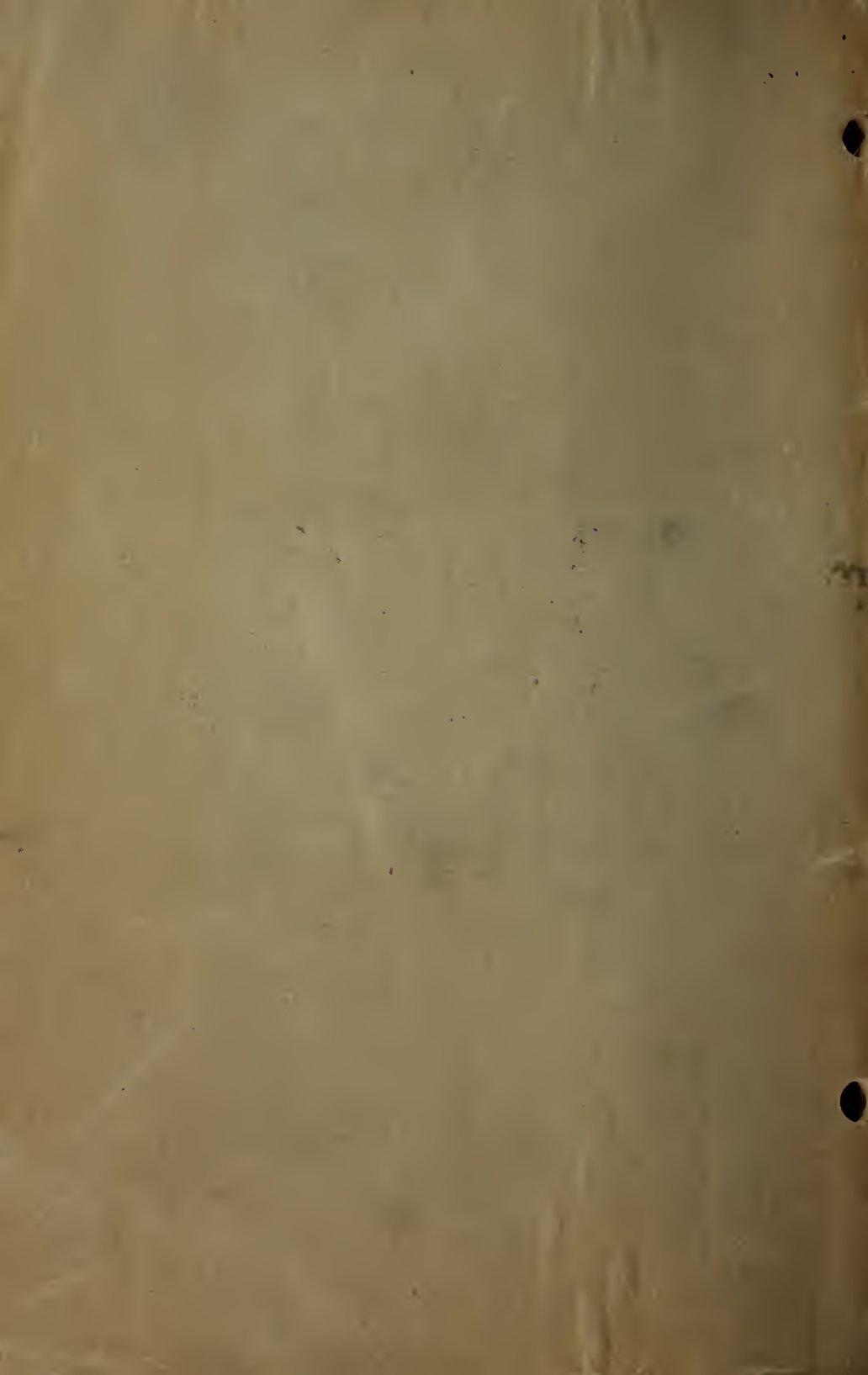
Streets.	Between what points.	Side.	Material.
Main, . . .	Alton to Shore Line R. R., . . .	Both.	Curb.
Orange, . . .	Humphrey to Cottage, . . .	West.	Curb.
Orange, . . .	Lawrence to Cottage, . . .	East.	Concrete.
Orange, . . .	Crown to George, . . .	East.	Brick relay.
Orchard, . . .	George to Gilbert av., . . .	East.	Brick.
Orchard, . . .	Oak to Sylvan av., . . .	East.	Brick.
Punderson, . . .	Goffe to Whalley av., . . .	West.	Concrete.
Redfield, . . .	Columbus to Congress av., . . .	Both.	Curb.
Spruce, . . .	George to Oak, . . .	East.	Brick relay.
State, . . .	Neck Bridge to Rock lane, . . .	North.	Curb.
Summer, . . .	Hamilton to Franklin, . . .	South.	Brick.
Sylvan av., . . .	Asylum to Winthrop av., . . .	North.	Brick.
Temple, . . .	Elm to Chapel, . . .	Both.	Curb.
Temple park, . . .			Concrete.
Walnut, . . .	Wallace to Hamilton, . . .	South.	Brick.
Warren, . . .	Wooster to Water, . . .	Both.	Brick relay.
Whalley av., . . .	Norton to Winthrop av., . . .	South.	Curb.
William, . . .	Bradley to Franklin, . . .	South.	Brick.
Winthrop av., . . .	Elm to Whalley av., . . .	West.	Curb.
Woolsey, . . .	Poplar to Blatchley av., . . .	Both.	Concrete.
Wooster square, . . .			Concrete.
Water (West), . . .	Meadow to Hill, . . .	North.	Brick.

STREET DEPARTMENT. STATEMENT No. 16.

Showing Liens placed upon Property by the City Inspector during 1874.

Name.	Location.	Amount.
Ahern, Patrick, ...	State, ...	\$ 17.50
Blatchley, Warren & Townsend, ...	State, ...	34.09
Blatchley, Warren & Townsend, ...	State, ...	91.00
Bushnell, C. S., ...	Chapel, ...	217.87
Bacon, Estate of N. A., ...	Chapel, ...	16.30
Burke, Patrick, ...	Elliott, cor. Oak, ...	119.02
Burnes, Mary, ...	Adeline, ...	38.59
Bree, Peter, ...	Jackson, ...	137.74
Bray, John A., ...	Hudson, ...	32.04
Cummings, Julia, ...	Locust, ...	48.82
Cummings, Julia, ...	Locust, ...	93.72
Clacken, Owen, ...	Locust, ...	168.69
Clacken, Thomas, ...	Locust, ...	131.72
Clacken, Thomas, ...	Locust, ...	58.81
Connell, Michael, ...	Jackson, ...	40.97
Chaplain, Chas. L., ...	Chapel, ...	343.06
Courtney, Thomas, ...	Oak, ...	3.19
Clark, Miles S., ...	State, ...	17.15
Dunlay, David, ...	State, ...	10.95
Delaney, Michael & Eliza, ...	State, ...	56.00
Denton, James W., ...	Sylvan av., ...	30.85
Denneen, Michael, ...	State, ...	17.95
Early, Owen, ...	Jackson, ...	36.41
Ess, Benjamin T., ...	Oak, ...	31.55
Ferris, Theodore, ...	Winter, ...	52.55
Fowler, Frank E., ...	Brewery, ...	10.10
Fuller, Emily, ...	Howard av., cor. Park, ...	77.55
Fallen, Matthew, ...	Hallock, ...	12.87
Flight, Estate of J. B., ...	Oak, ...	34.02
Gallagher, C. A., ...	Olive, ...	.50
Gaynor, C., ...	State, ...	5.49
Greene, Patrick, ...	Jackson, ...	39.43
Hope, Estate of Samuel, ...	Winter, ...	102.13
Healy, Daniel, ...	Hamilton, ...	245.04
Hanley, Judith & Eliza, ...	Brewery, ...	41.13
Homan, Charles, ...	Kimberly av., ...	57.03
Handy, Stephen, ...	Hudson, ...	87.72
Hine, Annie J., ...	Redfield, ...	43.75
Hill, Eugene C., ...	State, ...	28.53
Killoy, Patrick, ...	Jackson, ...	28.80
Knock, Jas. L., ...	State, ...	17.50
Linsley, Chas., ...	Foote, ...	56.47

Name.	Location.	Amount.
Lawler, Estate of James, ...	Oak, ...	\$ 10.72
Lovell, J. E., ...	Orange, ...	129.69
Monson, Estate of A. S., ...	Winter, ...	46.50
Monson, Estate of A. S., ...	Winter, ...	29.18
Monson, Estate of A. S., ...	High, ...	44.46
Monson, Estate of A. S., ...	Foote, ...	35.13
Monson, Estate of A. S., ...	Foote, ...	160.57
Maher, John & Catherine, ...	Blatchley av., ...	129.15
New Haven, Town of, ...	Sherman av., ...	311.98
Newgeon, Mrs. Francis, ...	Sylvan av., ...	24.47
Newhall, Estate of Geo. T., ...	Shelton av., ...	118.99
Newhall, Estate of Geo. T., ...	Shelton av., ...	100.25
Palmer, Elijah, ...	State, ...	24.00
Pfeil, Adam, ...	State, ...	17.50
Read, Theodore D., ...	Winter, ...	122.10
Read, Theodore D., ...	Foote, ...	93.32
Sheehan, Mary, ...	Jackson, ...	48.51
Smith, Samuel B., ...	Webster, ...	2.00
Saunders, Chas., ...	Orchard, ...	1.00
Staples, Geo. W., ...	Poplar, ...	1.00
Sperry & Plumb, ...	Sherman av., ...	232.30
Shannahan, M., ...	Asylum, ...	200.82
Searle, J. P., ...	Cor. Webster and Ashmun, ...	35.72
Stone, W. W., ...	Exchange, ...	118.00
Whittlesey, H. N., }	Whalley av., ...	21.20
Wilson, Mary, }		
Warrack, Jane, ...	Hudson, ...	36.20
Young Men's Institute, ...	Daggett, ...	47.00
		\$4,877.16



3525
N45

876-77/78

C. E. C. N. W.

626 01

Aug. 6 1879.

ANNUAL REPORTS

OF THE

STREET DEPARTMENT

OF THE

CITY OF NEW HAVEN, CONN.,

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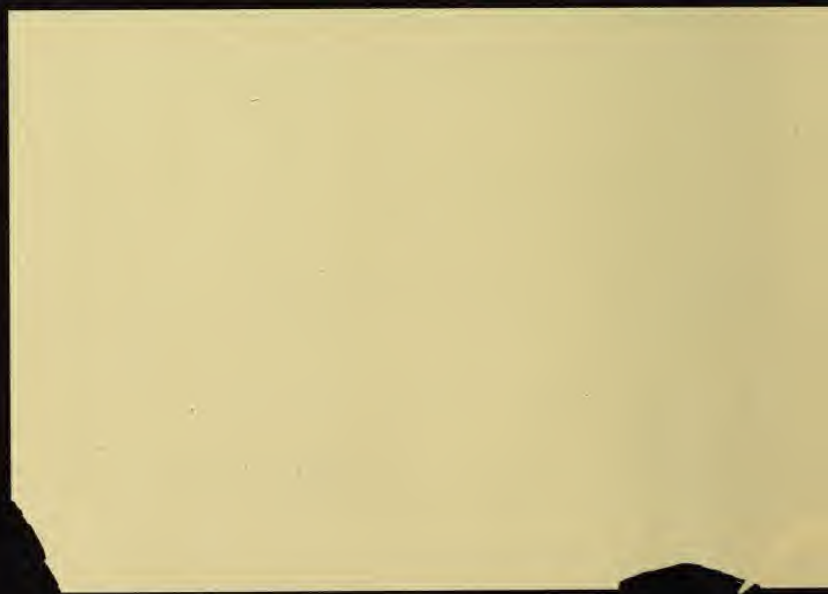
1879.

To

With the compliments of

Charles C. Fowler,

City Surveyor.



REPORTS
OF THE
STREET DEPARTMENT,

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UNIVERSITY OF ILLINOIS

1876, 1877, and 1878.

HARTFORD, CONN.:

PRESS OF THE CASE, LOCKWOOD & BRAINARD COMPANY.

1879.

BOARD OF ROAD COMMISSIONERS.

Chairman.

JOHN B. ADRIANCE.

Term expires Jan. 1, 1878.

Residence, 202 Crown st.

JOHN P. TUTTLE.

Term expires Jan. 1, 1878.

Residence, 120 Howe st.

MINOTT A. OSBORN.

Term expires Jan. 1, 1879.

Residence, 156 Olive st.

PHILO CHATFIELD

Term expires Jan. 1, 1880.

Residence, 19 Lyon st.

FRANCIS DONNELLY.

Term expires Jan. 1, 1880.

Residence, 101 Middletown ave.

Clerk.

FRED H. WALDRON.

Term expires Nov. 9, 1879.

Residence, 105 Howe st.

Office, Room No. 9, City Hall. Regular meetings every Thursday evening.

352.5
N45
1896-97-78

REPORT
OF THE
BOARD OF
ROAD COMMISSIONERS.

*To, the Honorable Court of Common Council of the City of
New Haven:*

I have the honor to transmit herewith the annual report of the Board of Road Commissioners for the year ending December 31, 1876.

By direction of your honorable body there have been transmitted to this Board during the year seventy-three orders, classified as follows: Five for opening, widening, and extending streets; four for grading streets; eleven for sewers; twenty-nine for walks and curbs; three for cobbling gutters; and twenty-one miscellaneous.

During the time above specified the Board have held sixty-one evening meetings at their office, and in addition thereto they have been called together quite often during the day time.

There have been before the Board to be heard on different matters 454 persons, and there have been received eighty special communications for the Board's action.

The Board have awarded contracts as follows: Seven for constructing sewers; three for grading; one for furnishing blue stone; one for furnishing cobble stone; one for furnishing sewer castings; two for bridge abutments and wing

walls ; and two for furnishing oyster shells. In every case these contracts were awarded to the lowest bidder in public meeting.

The Board have submitted to your honorable body for adoption the following named lay-outs of streets :

For a new street from Orange to State street, between Chapel and Court streets ; for extending Canal street to Munson street ; for a new lay-out of East Water street ; for extending Lamberton street ; for a right of way for a sewer near the easterly end of William street.

SEWERS.

Sewers have been constructed in twelve streets during the year, their length being $\frac{825}{1000}$ miles, which, added to the sewers previously constructed, makes a total length of sewers at the present time $32\frac{349}{1000}$ miles.

The emptying of the sewage matter upon the mud flats at the end of the Meadow street outlet was a source of complaint, and it was but a question of time when it would prove a nuisance.

In view of these facts, this outlet was, upon recommendation of this Board, ordered by your honorable body to be extended 500 feet into the harbor. Contracts were awarded and the work was commenced in August and completed in October last.

In addition to this work the outlet has been protected by piles being driven parallel with the outlet, every four feet, and two-inch planking fastened to these piles upon the inner side. The whole was then filled with mud dredged from outside of the work, thereby forming a protection to the sewer against floating ice, etc.

The total cost of this work was \$12,526.68. For further details regarding sewer work your attention is called to the report of the City Surveyor, and the tables submitted with this report.

PAVEMENTS.

No new pavements have been laid since the last annual report.

The Dixwell avenue pavement, which was reported as "nearly completed," at the close of last year, was finished early in the Spring.

Pavements have been repaired on thirteen streets at a cost of \$11,209.07.

\$657.25 was expended for repairs on the Chapel street wood pavement.

From \$500.00 to \$700.00 has been expended annually for the past four years for repairs on this pavement, and the expense of keeping it in repair must necessarily increase until it is replaced by something more durable and less expensive.

The cobble pavement on Gregson street, from Center to Crown street, was relaid at a cost of \$196.80.

For further details regarding repairs of street pavement your attention is called to Statement No. 8.

BRIDGES.

In February last Mr. C. S. Maltby gave permission to this Board to occupy the land over which the proposed approach to the new Quinnipiac bridge was to cross, provided that the bridge should not be open for public travel until he was paid for the land taken.

This Board asked for sealed proposals for constructing the wing walls, which were publicly opened on the evening of March 2, 1876. The contract was not awarded at that time, but was tabled for further information regarding materials, etc.

On the evening of March 6, 1876, information was given to this Board that the town of East Haven had refused to give their consent to a proposition to the effect that the constructing of the New Haven approach should not prejudice the case then pending in court for defining what constitutes the bridge. Shortly after, an order was received from your honorable body, directing this Board to delay further action in the constructing of these walls until the legal status of the City was properly defined in the premises, and for this reason the awarding of the contract was further postponed.

In August last your honorable body directed this Board to proceed with the work, and the expense incurred to be taken from the appropriation for this department. The contract was then awarded to the lowest bidder, Mr. Peter Small, and the work commenced in August and pushed vigorously forward so that the bridge was ready for public travel in December, but could not be thrown open for public use until assessments for damages and benefits had been laid for the land taken, etc., as per agreement with Mr. Maltby.

Your honorable body, in December, gave notice to this Board that the contracting committee had completed their labors so far as constructing the bridge proper was concerned, and placed it under the control of this Board, and the selectmen of the town of East Haven.

These boards have held several joint meetings for the purpose of determining some plan for taking care of the bridge.

They also sent a committee to the cities of Providence, Boston, Albany, and New York to enquire and report plans for opening the draw. This committee reported the power, etc., used for opening the draws in those cities, but these Boards have arrived at no definite conclusion further than to use hand power for the Quinnipiac bridge for the first year.

In March last the heavy rains carried away several bridges which spanned West river. The most serious damage done in this respect was the destruction of the bridge tide-gates and abutments to the bridge over West river at Congress avenue, necessitating the rebuilding of the bridge and new abutments.

The selectmen of the towns of New Haven and Orange, and the Board of Road Commissioners of this city, held several meetings to determine the best manner to repair the damage.

It was decided to construct a new bridge of iron, with substantial stone abutments, your honorable body authorizing this Board to do what was necessary in the premises, in behalf of the city.

Proposals were asked for by this Board for constructing the east abutment, wing walls, and filling. The contracts

were awarded and the work commenced and pushed forward to completion, the two towns constructing the west abutment and superstructure.

The bridge was opened to the public about October 1, 1876. The entire cost to the city was \$9,919.76.

TIDE GATES.

Your honorable body in November last directed this Board to enter, if possible, into an equitable agreement, in behalf of the city, with the towns of New Haven and Orange, and the owners of the meadows lying between what was Milford turnpike and Whalley avenue, for the construction of tide gates at Congress avenue bridge.

This Board referred the matter to one of its members as a committee to confer with these authorities and report to this Board.

After these preliminaries had been gone through with, this Board voted That the Board of Road Commissioners, in behalf of the city, do agree to pay one-sixth of the entire cost of erecting the tide gates at West river, provided the entire expense does not exceed \$2,100.00, and provided further, that the city do assume no further responsibility or maintenance of the tide gates or appurtenances thereto.

LEWIS BRIDGE.

In accordance with instruction, this Board submitted to your honorable body, through the City Surveyor, plans for a bridge over Quinnipiac river, in the place of the bridge known as Lewis bridge.

Your honorable body instructed this Board to construct, by and with the co-operation and aid of the town of East Haven, an iron bridge over Quinnipiac river at the above named point, at an expense not exceeding in the aggregate \$9,000.00, one-half of the amount to be paid by the city of New Haven.

Since this action has been taken, an effort has been made by the town of East Haven to discontinue so much of the highway leading to this bridge as lies in said town. This

action, together with the fact that no appropriation has ever been made by your honorable body to cover the expense of constructing this bridge, is the reason assigned for not carrying out the order.

There are in the files of this Board orders for a bridge over the railroad tracks at Dewitt street; the city to pay a portion of the expense. No action has yet been taken in this matter (other than to refer it to an appropriate committee) for the want of an appropriation.

MISCELLANEOUS.

There was appropriated to this department last year, under the head of "miscellaneous work," the sum of \$19,000, ostensibly for furnishing work for unemployed labor.

This Board, in order to carry out the wishes of your honorable body, set themselves to work to find something which might be done to give the unemployed something to do, and, at the same time, be of some service to the city.

The grading of some roadway which required a deep cut and a heavy fill seemed to be the most favorable plan which would employ the largest number of men.

Goffe street, which had recently been widened and straightened from Hudson street to Osborn avenue, required grading to a considerable extent.

The Board decided to put men and carts at this work. The time occupied in doing this work was 102 days. There were employed, on an average, 87 men and 29 carts daily. The cost of this work was \$12,688.07.

James street, from Market street to Ferry path, was also graded in this manner at the same time. There were employed, on an average, 34 men and 31 carts, daily, for about five weeks. The earth for this filling was carted from Clinton park, nearly a mile from James street. This work cost \$3,432.03. In addition to this work, Commerce street was partially graded, Chapel street bridge approach was filled, and Derby avenue repaired, costing in the aggregate \$2,740.34.

The total amount expended under this head was \$18,860.44.

It is safe to say that this work might have been done by contract for one-third this amount.

The rule adopted by the Board was to change the gangs of men each Monday morning, giving each gang one week's work at a time.

This was done as far as possible, with over 1,000 names on the rolls. Many no doubt worked on fictitious names; some were detected who were working under other names than their own, and were immediately discharged. There were a number who bought a horse and cart; on Monday morning they would get a license for carting, and at the end of the week would sell the same to the parties whom they bought it of the previous Monday, who would again sell it to some other parties for a week's work. It was almost impossible, even with the aid of the police, to detect the parties who practiced these and other schemes to get more than their proportion of the work, to the detriment of those for whom it was intended.

It is a question in the minds of this Board, whether this department should be used for dispensing charity to the detriment of the city treasury.

It is their opinion, however, that it should go through the proper channel, namely, the town, whose selectmen are the only authorized agents for dispensing charity.

Most of the grading during 1876 was done by the Board, at days' work.

On the evening of August 10, 1876, proposals were asked for by this Board, for grading the westerly end of Washington street. On the evening above mentioned, before the opening of the bids, the Town Agent offered to do the work for the purpose of giving employment to the men and teams under the charge of the town, and the expense of the same was to offset some of the bills against the town for sewer assessment, etc. The work was given to the town for the purpose above named. The work cost, according to the bill rendered by the Town Agent, \$3,187.25; the number of cubic yards of earth removed was 6,239, costing a fraction over 51 cents per cubic yard.

One of the bids offered for doing this work by contract, was 14 cents per cubic yard.

STONE CRUSHER.

6,145 cubic yards of stone have been crushed at the crushing works during the past year.

These works have not required any very extensive repairs.

The total amount expended at these works for 1876 has been \$7,315.02.

LICENSES AND PERMITS.

There have been 530 permits issued for connecting with water and gas mains, and 196 for connecting with public sewers. 35 licenses have been issued to parties to carry on the business of connecting with these mains, for which there has been received, and deposited with the Tax Collector, \$1,319.50.

There has been but little done in and around the public parks during the year, beyond the necessary repairs, and general care.

The tree protections placed around the trees in and adjacent to the public parks last year have been kept in good condition, and have thus far proved successful in keeping large numbers of insects and worms from the trees. This will, we hope, prove one of the most successful modes of preserving our trees that has been tried in this city.

For further details of work in this department during the past year, your attention is called to the reports of the City Surveyor, City Inspector, and tables accompanying these reports.

Respectfully submitted in behalf of the Board.

FRED. H. WALDRON, *Clerk.*

REPORT
OF THE
CITY SURVEYOR,
1876.

CITY ENGINEER DEPARTMENT.

OFFICE, ... Room No. 9 City Hall.
DRAUGHTING ROOM, ... Room No. 18 City Hall.

City Surveyor.

CHARLES E. FOWLER, Residence, 222 Whalley avenue.

Assistant City Surveyor.

ALBERT B. HILL, Residence, 4 Library street.

Sewerage Department.

CHARLES A. FERRY, Assistant Engineer.

*DAVID C. SANFORD, Transitman, etc.

Surveyors' Department.

CASSIUS W. KELLY, Assistant Engineer.

F. FLOYD WELD, Assistant Engineer.

†JOSEPH R. GAWTHROP, Assistant Engineer.

†HENRY J. KELLOGG, Transitman, etc.

*HENRY B. GORHAM, Transitman, etc.

*SAMUEL S. HOLLIDAY, Leveler, etc.

For Boards of Compensation, Assessments, Committees, Notifications, etc.

*ANTON COE, General Assistant and Draughtsman.

* Discharged November 9, 1876.

† Discharged September 9, 1876.

R E P O R T
OF THE
CITY SURVEYOR.

*To the Honorable Board of Road Commissioners of the City
of New Haven :*

I have the honor to present the Annual Report of the City Engineer Department, for the year 1876.

SEWERAGE.

The sewerage of the city, the most important of its public works, is the first matter to be considered. This department, as heretofore, has been under the immediate supervision of Mr. A. B. Hill, First Assistant Engineer, with Mr. C. A. Ferry, Assistant Engineer, in charge of the work, and the preparation of the maps and plans. In the year just past, there has not been as much done as in several of the preceding ones, as less than a mile of sewers was added to the total length. Since the adoption of our system of sewerage, the work of construction has been carried forward in a thorough and systematic manner, so far as the sewers are concerned, and at all times it has been the endeavor of the department to secure for the benefit of the city first-class work, and a strict compliance with the contracts. In the preparation of the specifications for our sewer contracts, great care and attention has been paid that they shall be full and explicit, and provide for every detail considered requisite for good and thorough drainage.

SEWERS BUILT.

Previous to January 1, 1876, the total length of sewers and drains laid in the streets of our city, of every description, so far as known, amounted to 32.342 miles.

The discontinuance of a few small pieces, and the rebuilding of some portions, reduces the length in actual use, to 31.524 miles. During the year there were built :

506.9 feet of sewer,	.	.	.	74 inches in diameter.
626.0 " " .	.	.	.	36 " "
836.8 " " .	.	.	.	24 " "
108.7 " " .	.	.	.	18 " "
1,747.9 " " .	.	.	.	15 " "
531.9 " " .	.	.	.	12 " "

Making a total length of 4,358.2 feet, or 0.825 miles. The length of sewer discontinued or rebuilt during the year, was 0.080 miles, leaving a net increase of 0.745 miles. This added to the amount previously constructed gives 32.349 miles, as the length of sewer completed, and in actual use at the present time.

The largest and most important construction of the year was the extension of the Meadow street outlet sewer 500 feet further towards the channel of the harbor. This is the largest sewer of our system that has been constructed thus far,—the sectional area being equal to that of a circular sewer of 74 inches diameter. It is built of brick and stone, resting on a pile and timber foundation, and with a fall of one foot in two thousand feet.

A section of this sewer is shown in plate 1, in my annual report of the year 1873.

The construction of the sewer in Portsea street, from Meadow street to Water street, provided the proper means for carrying off the great quantities of surface-water that come from that section of the city westerly of Water street, and which was often the cause of considerable damage and trouble.

The same can also be said of the short piece of sewer built in Liberty street, from Silver street to the New Haven & Derby Railroad track, intercepting as it does, and taking

into the sewer, the great quantities of surface-water, in time of storms, that reach that point from three directions.

CONDITION OF SEWERS.

With but very few exceptions, our sewers are now in excellent condition, and performing the work required very satisfactorily. There are still a few places in the old sewers that need correction, but nothing, so far as known, that requires immediate attention. There are yet a few places where the sewer junctions are at right angles, which it will be necessary to change to a curve. Some of the basins and culverts along the line of the older sewers are found to be defective owing to improper construction, and on some of the sewers there are no man-holes built up to the surface of the street. The correction of these errors, or omissions, is a work that is prosecuted from time to time, as other duties will admit, being done generally by our sewer inspectors.

We are troubled considerably, in times of heavy rains, by the washing of sand into the sewers in a few unpaved streets, with steep grades and sandy soil. At such times the sand fills the basins to the level of the outlet-pipe and is then washed into the sewers, rendering it necessary to clean them, sometimes at considerable expense. The streets that may be particularly mentioned as being of this class are Oak, Prospect, and West Water. This matter cannot be fully remedied until the sewers are extended, and the surface water taken into them from points nearer the summits of the hills, but by careful attention, and the cleaning of the basins after each storm, much of the trouble and attendant expense might be avoided.

MAPS.

Maps of the sewers laid during the year have been made, showing the location of the sewer, man-holes, culverts, basins, hubs for house connections, size, grade, and depth. Maps for the assessment for the sewers have also been made, showing the size and dimensions of the adjoining property on each street, and giving the names of the owners.

An effort has also been made during the year, as other

duties would allow, to complete the maps of our whole sewerage system. We shall also endeavor, during the coming year, to perfect the plans and maps, so far as it is possible, of the sewers constructed before the adoption of our present system.

HOUSE DRAINAGE.

The subject of house-drainage, and the connections from the public sewers to adjoining property, is deserving of much attention. I have referred to it in former reports, calling attention to the great importance of the subject, and urging a more thorough and systematic manner of performing the work. A great defect in a large number of existing house drains is the absence of a trap of any description, between the house and the sewer. This ought to be remedied at once, and all persons hereafter should be compelled to put in a proper trap when laying a house drain. The trap should be located just outside of the house, and have a pipe leading up to the surface of the ground from just back of the trap. With this upright pipe a connection should be made with a leader or conductor from the roof, in order that when a rain-storm occurs the water from the roof would cleanse the trap from any sediment that may have lodged there.

In some cities of this country, the placing of such a trap in the drain is always done by the property-owners, there being no question in regard to its necessity, and in others it is compelled by a city ordinance.

The city of Providence, R. I., has an excellent law on the subject, which reads as follows :—

“All persons are required to place an effectual trap in the line of drain just before it leaves the premises, and to make an open connection with a down-spout back of the trap.”

In a former report, I suggested certain rules that I considered necessary to be observed in the execution of this work, and I still think that something of the kind should be adopted and strictly enforced. These rules provided that none but thoroughly competent men should be licensed to engage in the business of laying house-drains ; that the use of any inferior or imperfect pipe should be prohibited ; that

the pipe should be laid to true grades, and all joints made water-tight, and that there should, in all cases, be a trap of some approved pattern located between the house and the sewer.

Of late years there has been some improvement in the workmanship, and in the quality of material used, and could all the work hereafter be done in accordance with certain approved specifications, the parties particularly interested, as well as the public at large, would be greatly benefited thereby.

The proper trapping and ventilation of house drains I consider of the greatest importance. The interior of our houses being brought into very close communication with the sewers by the drains and pipes, every possible precaution should be taken to prevent the escape of foul air or sewer gases.

That *sewer gas* is a deadly poison, and its presence in our dwellings very dangerous to public health, there can be little or no question. That sewer gas of the *virulent kind* exists in the sewers, to any great extent, I am not ready to admit, yet its presence is possible, and at all times the sewer air is objectionable.

The natural tendency of the air in the sewers is to reach the higher levels, and unless precaution is taken to prevent it, will rise in the house drains and pipes and escape through every opening.

In addition to the trapping of the drain and the pipes in the house, and for the purpose of thorough ventilation, a pipe should be carried from the highest point of the soil pipe to some point above the roof of the house, making another free communication with the open air.

The house drain and all the pipes may be thoroughly and properly trapped, but unless there is a pipe for ventilation also provided, trouble may be expected, for it most certainly is liable to come at any time. In the waste pipe, between the trap outside of the house and the traps at the closets, bowls, etc., there may be a body of confined foul air, and every time a large amount of water is thrown into the pipe from the bath tub or other point, a certain amount of air must escape.

If no ventilation or escape pipe is provided, this air will force the traps at the bowls, etc., where it meets the least resistance. When a large body of water enters the lower part of the pipe, the tendency is to produce a vacuum, and in this way, it very often happens that the small traps are syphoned out and remain dry until filled again with water. At such times the ventilating pipe would admit the necessary supply of air, and obviate the difficulty. After a very careful study of the most recent investigations relative to house drainage, I should recommend the following arrangement, namely: a trap in the drain outside the house; a pipe leading from the back of the trap up to the surface of the ground and there connected with a leader or conductor from the roof; and a ventilating shaft, the full diameter of the soil pipe, running from the highest point of the latter (preferably near a chimney or flue) to a point several feet above the roof. Experience has shown that, owing to the warmer atmosphere of the house, and the consequent heating of the internal pipes, there is a constant circulation of air through the pipes;—coming down the outside pipe and passing up the soil and ventilating pipe, which can not be otherwise than of great value as a purifying agent.

I shall offer a few quotations, to show the great importance placed upon the proper arrangement and construction of house drains, by recognized authorities:

“Sewer air may escape very freely in our dwellings before its presence will be suspected, and that this happens very often there can be no sort of doubt. There are many reasons for this belief. One cause for such escape, and a very active one, is found in the difference of temperature between the interior of our houses and the interior of the underground sewers. A rarefaction of air and an upward current are thus induced. The joinings of the soil pipes are imperfect from alternate expansion and contraction by exposure to hot or cold water, and unless a free and safe vent is provided above, there must be leakage at these points.”—*Report of State Board of Health of Mass.*, 1873.

After describing the proper arrangement of pipes, traps,

etc., in the houses, and especially the ventilating pipe passing through the roof, the same report above quoted goes on to say that :

“By this arrangement all stagnation is prevented; the contents of the house drains are constantly exposed to the oxidizing and purifying influence of currents of air; when rain conductors are filled with water there is still free escape for the sewer gases; and the water traps throughout the house are relieved from pressure both of the pent-up sewer air on the one side, and of suction or atmospheric pressure on the other.”

In the report on the sewerage of Providence, Mr. J. Herbert Shedd says :

“No amount of skill, care, and expense in building the public sewers will relieve the property-holder from the necessity of constructing the private drains with all possible care. These drains often cause, in the aggregate, more trouble on account of imperfect plan and construction than all the rest of a sewerage system.”

Mr. David W. Cunningham, in the report on the sewerage of Lowell, says :

“A system of sewerage may be tolerably perfect in itself, but if the house drainage is not properly carried out, it must fail to produce the good results which are expected of it.”

In the report on the sewerage of Boston, by a commission consisting of Messrs. E. S. Chesbrough, Moses Lane, and C. F. Folsom, I find the following :

“No system of sewerage and no degree of perfection in the sewers themselves can be expected to render dwellings free from bad smells or danger to health, unless the house drains, soil pipes, etc., be also carefully attended to.”

In the report on the sewerage of Chicago, Mr. E. S. Chesbrough made the especial point that the usefulness of the sewers depended very much upon the faithfulness with which the house drains were laid.

Mr. Baldwin Latham, in “Sanitary Engineering,” says :

“The work of house drainage is the crowning point of a system of sewers. Upon the care and skill bestowed in

carrying out this portion of the sanitary requirements of a district in a great measure will depend the ultimate success of the whole in a sanitary point of view. It cannot be overlooked that imperfect sanitary works in connection with the houses in which we reside will result in the malarious influence of the sewers and drains being brought to bear directly upon their occupants. As a rule, the works of house drainage are carelessly and thoughtlessly carried out, and often inflict untold injury on the luckless occupants of the house in which they are executed."

"The normal condition of the generality of houses has an important bearing on the necessity for the ventilation of sewers and drains. The superior temperature of the air of houses, and the draught caused by chimneys, have the effect of causing the various traps that are used to seal the drains to be relieved from pressure. Consequently, as there is less atmospheric pressure upon traps within houses than upon external traps, and, moreover, as many of the traps used within a house have far less seal than those usually employed out of doors, when no ventilation is provided, gases are sure to escape into houses at the point of least resistance."

"In the experience of the author, the best way of ventilating house drains is the true Roman type of carrying up ventilating pipes at the heads of the drain and its branches."

Before leaving the subject I should say a few words relative to the improper use of house drains :

Sewers and house drains are designed for the removal of *liquid* refuse,—not the entire garbage of a family. Drains are not intended to carry ashes, broken bottles and crockery, old clothing, shoes, etc., but such things are often found in the sewers. House drains cannot be expected to act satisfactorily unless there is a liberal supply of water for them. When a stoppage occurs in the pipes and sets the water back into the cellars, nine times out of ten it will be found that the trouble is in the house drains instead of the sewer, and caused by their use for improper purposes.

TABLES.

Following the reports of the Street Department will be found several tables, giving a large amount of detailed information concerning our sewers. Statement No. 1 gives in a concise form a description of every sewer in the city,—showing the location, length, size, material constructed of, the contract price per foot, and the total cost, so far as it has been possible to ascertain the facts. Owing to the absence of proper record of some of the older sewers, it is impossible to make the statement complete.

This statement is a compilation from former reports, with such additions and corrections found necessary to be made, and will prove of service to members of the City Government and our citizens generally.

Statement No. 2 gives the total length of sewers built, of every size, and the length of each in use at the present time.

In Statements No. 3 and 4 will be found the details of the sewer work during the year, and in Statements No. 5 and 6 are given a comparison of the bids for sewer work, and an average of the contract prices. To all of these attention is respectfully called.

STREETS.

From a careful measurement and estimate, it is found that we have at the present time 128 miles in length of public streets and avenues. Of this amount $25\frac{1}{4}$ miles are within the limits of the Seventh Ward (Fair Haven), and the balance, $102\frac{3}{4}$ miles are westerly of Mill river.

STREET PAVEMENTS.

The total length of street pavement of all kinds, laid to date, amounts to 14.953 miles. This amount includes 2.503 miles that have been repaved, and 0.344 miles that have been destroyed by change of grade, etc., so that the length of street pavement in use at the present day is but 12.106 miles, or less than 10 per cent. of the total length of streets. This length is divided among the different kinds of pavement as follows:

Telford,	.	.	.	.	.	8.530	miles.
Belgian,	.	.	.	.	.	2.227	"
Wood,	.	.	.	.	.	0.558	"
Concrete,	.	.	.	.	.	0.308	"
McAdam,	.	.	.	.	.	0.322	"
Cobble,	.	.	.	.	.	0.161	"
						12.106	"

To me it seems as though it would be wise to do considerable work in the laying of new pavements the coming year, on those streets most needing them, as there has never been a time it could be done better and cheaper than at present. As a general thing our pavements are in good condition, as quite a large amount of work in the way of repairs was done during the year just past. On some of the narrow streets where there is a horse railroad track, some trouble is experienced from the "rutting up" of the Telford pavements, owing to the travel being thrown into a single track. These defects have been repaired, from time to time, in the ordinary way, and I do not know as the plan could be improved upon. I find, in looking over the reports of other cities, that some of them complain of the same thing, and it has been suggested as a remedy in part that it be required that the wheels of wagons and trucks used for carrying very heavy loads be provided with wide tires. Such a course would probably be beneficial, and it is well worth thinking of.

STREET GRADING.

There was but little work done in the grading of streets by contract. The largest job completed was the grading of the approach to West Bridge, and the smallest one was the grading of Rose Court. The contract prices have varied from eight to thirty-three cents per cubic yard,—the average being twenty-three cents.

The details of the work in street grading are fully shown in Street Department statements No. 8 and 9.

WALKS AND CURBS.

During the summer season a considerable portion of the time of the department is taken up in giving lines and grades for walks and curbs ordered by the Court of Common Council. The total length of this work done during the year was about seven miles, not including the curved corners which are now given in all cases.

SURVEYS AND MAPS.

Maps have been prepared in all cases required by the different boards and committees of the Court of Common Council, for the purpose of laying out, assessing, etc., the various public improvements made during the year.

By direction of the Board, a map case has been prepared, in which are now systematically arranged all the detail maps of the different sections of the city.

ELEVATIONS.

As an item of general information, and for the purpose of answering questions very often asked, a table has been prepared (No. 15), showing the elevations of grade above mean high water, (the city datum) of street corners in different sections of the city, given to the nearest foot.

MERE STONES.

For defining the lines of streets, 163 "mere stones" were set during the year. These stones are set in most cases at the street corners, in such a manner as to clearly define the lines of both streets, and, so far as it can be done, the tops of them are placed at the grade of the sidewalk.

BRIDGES.

There are fourteen bridges which the city has wholly or in part the care of. Of this number, three cross the Quinnipiac river, and are maintained in part by the city, and in part by East Haven. Crossing Mill river there are four bridges, and these are maintained wholly by the city. The other

seven cross West river, but as the easterly bank of the river is the City line, the easterly abutments and approaches only of these are required to be maintained by the city, the bridges themselves being built and maintained by the towns of New Haven and Orange. There are but five of these bridges that have received particular attention, as hereafter described. On the other nine but little has been expended the past year, but some of them will need rebuilding at no distant day.

WEST BRIDGE.

The old bridge, which was a cheap wooden structure about twenty-five feet wide in two spans of eighteen and nineteen feet, was carried away by a freshet in the spring of 1876, the flood also scooping out a channel through the easterly approach about 100 feet wide and twenty feet deep at the middle below high water.

A temporary pile bridge with suitable approaches was soon constructed just north of the site of the old one by the joint action of the city and town of New Haven, and the town of Orange.

The average width of the river for about a quarter of a mile above and below the bridge being about 110 feet, and the water ways of the old bridge very inadequate in times of freshets, it was decided to make the new water-way ninety-seven feet clear.

As the center of the channel is the boundary between the towns of New Haven and Orange, and the easterly bank of the river the boundary between the City and Town of New Haven, by far the greater burden of the new construction, viz., the easterly abutment and its approaches, fell upon the city—the westerly abutment and approaches being built by the town of Orange, and the superstructure jointly by the towns of New Haven and Orange. The abutments and wing-walls are built upon a pile and timber foundation, the piles being cut off at low-water mark, the space between them and for five feet outside thoroughly riprapped, and the foundations of the retaining walls of the approach connected by tie-beams supported on piles. The face and corners of

the abutments are coursed masonry, and the wing-walls and backing of the abutments rubble, laid in cement. The coping on the wing-walls is two and one-half feet wide, one foot thick under railing, with a six inch wash outside the railing, and one inch bevel on the inside to conform to the slope of the walk.

The city abutment and approach contains

188	piles.		
1,600	cubic yards of riprap.		
490	"	"	of masonry.
11,119	"	"	of earth filling.
21,200	feet B. M.		of timber and plank.

The total cost to the city, including the approach to the temporary bridge, etc., was \$9,919.76.

The superstructure is a wrought iron pin-joint Pratt truss bridge, 100 feet from center to center of end supports, with forty feet clear roadway, and six feet clear sidewalk on the southerly side, built by the Watson Manufacturing Company of Paterson, N. J., and calculated to carry with safety, besides its own weight, a moving load of eighty pounds per square foot of roadway and sidewalk, equal on the whole bridge to 160 tons.

There are two trusses fourteen feet three inches in depth from center to center of pins, with seven panels fourteen feet three inches each. The top chords and inclined end posts are made up of a top plate twenty inches wide and $5\frac{5}{16}$ of an inch thick, two side plates 12 inches deep and four $2\frac{1}{2} \times 2\frac{1}{2} = 5$ lbs. angles, the side plates varying in thickness, according to the strains. The two middle posts are made up of two light eight-inch channels connected by lattice bars. The other two vertical posts have a similar section made up of plates, angles, and lattice bars. All the tension members are eye bars. The floor beams are wrought iron lattice girders three feet deep, resting on cast-iron bearing blocks in the base of the posts. The joists under the roadway are five inch by fourteen inch yellow pine, and the planking two inches thick of planed yellow pine. The superstructure contains 37.6 tons of iron, and 30,500 feet B. M. of timber and planking, and cost \$5,921.25.

CHAPEL STREET BRIDGE.

In accordance with your instructions, an examination and report was made early in the spring in regard to the condition of the Chapel street iron swing bridge, and such repairs made as were imperatively needed. The long suspension rods were clamped to the top chord, to prevent them from slapping against the trusses and frightening horses. The annular rack on the pivot-pier, which had become misplaced so that the cogs on the pinion barely touched in some places, was brought back to its place and secured, and a new pinion put in, as some of the cogs were broken out of the old one. The end supports were leveled up and the suspension-rods adjusted for the temperature at that time.

In order that the bridge may have at all times a firm bearing on the abutments, adjustable supports are necessary. For if the suspension rods are adjusted so that at the lowest temperature the bridge will just touch on the end supports, then when the hot summer's sun heats the rods they will elongate, while the lower chord being protected from the sun and cooled by the water under the bridge will not expand proportionally, and the ends of the bridge will be let down and bear so heavily on the end supports that the ordinary turning gear could not move it.

Another cause of the shaking of the trusses is the light roadway, which is inadequate to secure rigidity with the heavy traffic over it. The roadway is twenty feet wide, and the floor beams nine inch I beams twelve feet apart. It was recommended that when the bridge is replanked the position of certain of the present floor beams be changed and six twelve inch forty-two pound I beams added to the draw span and two to each of the fixed spans; and that the present 6×8 inch joists be replaced by 4×12 inch, which, with the same amount of material, would give nearly double the strength and stiffness. A rigid roadway and adjustable end supports, so the end of the draw would always have a firm bearing, would obviate the present oscillation and shaking, and add greatly to the life of the bridge.

QUINNIPIAC BRIDGE APPROACH.

Work was commenced on this approach the latter part of August, and it is now completed with the exception of a portion of the coping, the railing, and a small amount of filling. The retaining walls are of East Haven rubble sandstone, laid in cement from eight to fifteen feet high, three feet wide at the top, four feet five inches to five feet three inches at the base, and batter an inch to the foot on the front. They rest on a pile and timber foundation, the top of which is three inches below average high water, and two to three feet below the surface of the ground. The piles are from six to twenty-eight feet long, driven to the bed rock through a top crust of shells, then soft mud, brush, and a thin layer of sand and gravel over the rock.

The foundations on the two sides of the approach are tied together by ten by twelve inch timbers, supported every eight and a half feet on piles.

The walls have a backing of oyster shells from four to six feet thick, and the remainder of the filling is earth.

LEWIS BRIDGE.

This structure is in a very dilapidated condition, and its days of usefulness as a bridge are numbered. In accordance with instructions from the Court of Common Council, examinations and soundings have been made with reference to a new structure, and plans and estimates prepared for a wrought-iron bowstring bridge of one clear span of 150 feet, for a wrought-iron Pratt truss bridge of the same span, for a wrought-iron continuous girder in two spans of 75 feet each, with the "Cushing" middle pier, and for a wooden triangular truss bridge in three spans of 50 feet each, with pile piers. The plans are all for 18 feet clear roadway and new abutments. In the bowstring plan the truss is made very deep to secure economy, and great care taken to secure lateral stiffness by wide arches and a thorough system of lateral bracing.

In June, 1876, an order was passed by the Court of Common Council, directing the Board of Road Commissioners

“to construct, by and with the co-operation and aid of the Town of East Haven, an iron bridge over the Quinnipiac river, in place of the bridge known as Lewis Bridge.” The order further provided that the expense should not exceed nine thousand dollars (\$9,000), and one-half to be paid by the city.

It is well known that the authorities of East Haven are adverse to any project for rebuilding or improving this bridge that would call for a large expenditure of money, and I am inclined to think that they would refuse to enter into any agreement for paying one-half the expense of constructing an iron bridge.

As the center of the river is the dividing line between the City of New Haven and the Town of East Haven, and the expense of any improvement of the bridge must be borne equally by the two corporations, it appears to me that it would be advisable for this Board, or for the Court of Common Council, to appoint a committee to confer with the Board of Selectmen of the Town of East Haven, for the purpose of ascertaining if the proper arrangement for the construction of this bridge can be made. If a mutual agreement cannot be made between the authorities of the two corporations, and it is desired on the part of the city to carry out the order for a new bridge, the manner of procedure is defined by the General Statutes of the State.

KIMBERLY AVENUE BRIDGE.

The bridge over West river, and the causeway across the meadows—being that part of Kimberly avenue westerly of the city line—has been widened by the authorities of the Town of Orange. An effort has already been made by parties interested to have the city take steps to continue the widening easterly to the upland, although no petition has yet been presented to, or order passed by, the Court of Common Council in reference to it. Such a course would necessitate the widening of the small bridge over the easterly branch of the river, and I consider it, under the circumstances, an improvement that should be carried out ; however, as I under-

stand the lines defining the limits of the city, I cannot see that the City of New Haven could properly be called upon to perform the work or meet the expense, believing that to be a matter wholly within the jurisdiction of the Town of New Haven.

MISCELLANEOUS.

In our department there is a large amount of work of a miscellaneous character.

Under the charter and ordinances the City Engineer Department, in addition to the regular work of the department, is required to perform such duties as may be called for by the Mayor, any of the different boards of Commissioners, Compensation or Assessment, and for any committee of the Court of Common Council.

The department is also continually called upon by individuals and corporations for lines, grades, etc., which it is proper and necessary should be given, and which has taken up, I should judge, on an average, the full time of one man per year.

NOTIFICATIONS.

In all cases of hearings before the Board of Road Commissioners, the two Boards of Compensation, the Committee on Building Lines, etc., in reference to the laying out of new streets, the widening and straightening of old ones, and the assessing of benefits and damages for the same, and for the assessments for sewers, pavements, building lines, etc., it is required by law that the interested parties shall be personally notified, at least six days before the time appointed, of the time and place of such hearing. A large portion of this work is done by this department, which also includes the preparation of the necessary maps, the finding of the ownership of the property, rendering necessary a thorough search of the land records, and the serving of the notices.

The record of our work for the year is as follows :

For Board of Road Commissioners, prepared and served,	. . .	191
“ “ “ Compensation, served,	. . .	
“ “ “ (assessment) prepared,	. . .	405
“ various other purposes,	. . .	25

The notices for the Board of Compensation, on opening and widening of streets, are prepared by the clerk of the Board, and those of the Board for assessing sewers and pavements are served by the clerk of the Board. The notices for the committee on building lines are prepared and served by the clerk of the committee.

CONCLUSION.

Owing to a lack of funds, it became necessary to reduce the force of the department, in the latter part of the year. The members discharged were Joseph R. Gawthrop, Assistant Engineer, who had been in charge of the work in the Fair Haven district, David C. Sanford, Henry J. Kellogg, Anton Coe, Henry B. Gorham, and Samuel S. Holliday, transitmen, levelers, and draughtsmen. All had been connected with the department a number of years, serving the city efficiently and faithfully.

With the number now retained by the Board, we expect to be able to perform the duties required the coming year unless the call shall be greater than is now anticipated.

In the early part of the year, a small book was prepared, containing copies of the plans, sections, etc., of some of the principal portions of our public works, and placed on exhibition at the Centennial Exposition. The claim made for the exhibit was excellence in design, accuracy and neatness in the drawings, and the thorough and systematic manner of keeping the records relating to our sewers and other public works.

The award of a medal and diploma by the commission would seem to show that the claim was a good one.

Respectfully,

CHARLES E. FOWLER,

City Surveyor.

CITY INSPECTOR'S DEPARTMENT.



CITY INSPECTOR.
PATRICK WARD.

Term expires Nov. 9, 1879. Residence, 2 Kimberly Avenue.



CLERK.
FRED H. WALDRON.



Office, Room 9, City Hall.

R E P O R T
OF THE
CITY INSPECTOR.

To the Honorable Board of Road Commissioners of the City of New Haven :

I have the honor to submit herewith a brief statement of my official acts during the year 1876.

Agreeably to your instructions, I have caused thirty-four new crosswalks to be constructed during the past year, and a large number of existing crosswalks have been relaid and otherwise repaired.

The amount expended under the head of crosswalks was \$9,347.08.

The expense of cobbling all gutters was taken from this appropriation, as there was no appropriation made for that purpose.

Gutters have been newly cobbled or relaid in the whole or portions of the following named streets and avenues: Columbus street, Congress avenue, Davenport avenue, Howard avenue, Lamberton street, Portsea street, Prince street, State street, and View street.

There were 22,341 square feet of cobbles laid at the above named places, at a cost of \$1,340.46. One-half of the expense of cobbling the gutters on Congress avenue, Davenport avenue, and Lamberton street is to be assessed on the owners of adjoining property, in accordance with the rule lately established by the Court of Common Council.

As soon as this work is entirely completed and the expense

is known, the entire cost will be reported to the Court of Common Council for assessment.

The whole or portions of sixty-five streets have been turnpiked, at an expense of \$4,301.75. In addition to this cost, a portion of the expense for the repairs on Derby avenue, which was badly washed out and damaged by the heavy rains in March last, and also the repairs and a portion of the filling on Davenport avenue, was paid for from this appropriation, which, added to the above, makes the total amount expended for turnpiking streets, \$6,031.95.

For further details regarding turnpiking streets, your attention is called to Statement No. 11.

The following named streets were graded by me by days' work :

Castle street, Lawrence street, Lombard street, Minor street, Portsea street, Tyler street, and View street.

Orders for sidewalks and curbs have been completed on 48 streets, the total length of which was $10\frac{3}{4}$ miles.

Statement No. 13 shows this work in detail.

The following named bridges have been replanked, and otherwise repaired : Barnesville bridge, Chapel street bridge (West river), Chapel street bridge (Mill river), Kimberly avenue bridge, State street bridge, Oak street bridge, and Quin-nipiac bridge (Grand street). For the cost of this work in detail you are respectfully referred to Statement No. 12.

As will be seen, the expense has not been very great for keeping these bridges in repair during the past year.

The amount (\$1,899.76) for the Chapel street bridge over Mill river includes the services of the bridge-tender (\$720.00), and also the expenses of filling in the causeway upon the westerly end of the bridge. This causeway, constructed as it is upon the mud, continually settles, and consequently necessitates more or less filling each year.

In obedience to your instructions, I caused the cobble pavement on Gregson street, from Center street to Crown street to be relaid, the expense of which was small.

A portion of the cobble pavement on Custom House square was relaid, necessitated by a change of grade caused by the extension of State street to Union avenue.

I have also caused several rows of Belgian to be placed around quite a number of the sewer man-holes on the Telford pavements. Many of these places had become dangerous by reason of the iron man-hole heads projecting from two to three inches above the pavement.

I have had, on a daily average, during the year, forty men under my charge, for clearing street pavements, crosswalks, and gutters, for repairing earth-roads, and around bridges, for clearing out the catch-basins and receiving-basins, and for repairs generally in my department.

It has been my aim to change the gangs of men on the weekly pay-roll each Monday morning, so far as I could do so consistently with the workings of my department, so as to give these men a week's work at a time, and by this means distribute the work among as many as possible.

The item of carting the street cleanings and deposits from the catch-basins, etc., is considerable. The only place that can be used for a dumping-ground is over the East street outlet sewer. This makes the haul very great, especially when carting west of State street. The distance from State street to the East street outlet is nearly one mile.

During the past year the new street laid out over the old swamp (Commerce street), has been used for a dumping-ground to some extent, but as that street is substantially filled and graded, it cannot be used longer for this purpose.

The mud flats at the foot of Franklin street were also made available for dumping, until parties in the vicinity complained of it as a nuisance, since which time I have prohibited the dumping of anything there.

There were but few liens placed upon property by me during the past year for non-payment of bills due this department. The amount, as will be seen by reference to Statement No. 16, amounts in the aggregate to \$868.32.

Respectfully submitted,

PATRICK WARD,

City Inspector.

STREET DEPARTMENT—STATEMENT No. 1.

SEWERS AND DRAINS.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Academy street.....	660.0	18 in. C. P.	....	\$1,844.00
Anderson street.....	37.0	36 in. B.	City.	
Argyle street.....	300.1	24 in. B.	"	1,473.54
Artisan street.....	569.9	12 in. V.	"	1,203.21
Ashtun street.....	32.5	30 in. B. 8 in. I.	\$2.87	
Ashtun street.....	15.6	24 in. B. 8 in. I.	2.72	
Ashtun street.....	286.0	24 in. B. 4 in. I.	1.85	1,614.05
Ashtun street.....	333.0	12 in. C.	1.20	
Auburn street.....	58.6	15 in. C.	1.60	386.95
Audubon street.....	34.5	15 in. C.	1.75	110.65
Bee's street.....	37.7	18 in. C.	3.00	
Beers street.....	5.0	15 in. C.	2.45	194.62
Beers street.....	676.3	15 in. C.	1.50	
Beers street.....	442.9	15 in. C.	1.50	
Beers street.....	154.1	15 in. C.	1.40	2,644.41
Bishop street.....	67.4	24 in. B.	2.65	
Bishop street.....	54.7	15 in. C.	2.10	228.38
Bradley street.....	680.0	18 in. C.	....	119.17
Bradley street.....	44.2	24 in. B.	City.	1,457.49
Bradley street.....	40.0	15 in. C.	4.60	243.44
Bradley street.....	836.8	24 in. B.	3.48	319.39
Bradley street.....	269.9	18 in. C.	2.69	
Bradley street.....	438.4	15 in. C.	2.20	6,377.39
Bradley street.....	169.5	12 in. C.	2.00	
Brewery street.....	44.5	18 in. C.	2.65	
Brewery street.....	5.0	15 in. C.	1.95	184.46
Brewery street.....	495.8	15 in. V.	2.65	
Brewery street.....	163.7	12 in. V.	2.00	

STREET DEPARTMENT—STATEMENT NO. 1.—(CONTINUED.)

LOCATION.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Brewery street..... Wooster to Chapel.....	177.3	15 in. V.	\$2.65	\$3,000.19
Brewery street..... ".....	136.4	12 in. V.	2.00	
Broad street..... Corner of Oak.....	84.0	15 in. C.	2.75	950.54
Broad street..... ".....	5.0	12 in. C.	2.50	
Broad street..... Oak to George.....	481.5	12 in. C.	1.15	1,055.93
Broad street..... Oak to Lafayette.....	106.6	15 in. C.	2.65	589.83
Broad street..... Lafayette to Rose Court.....	155.5	15 in. C.	1.20	578.11
Broad street..... ".....	52.3	12 in. C.	1.00	
Broadway..... York to Howe.....	1250.0	24 in. C.	....	.....
Broadway..... Park street to Dixwell avenue.....	630.0	18 in. C.	3.30	2,428.00
Broadway..... Whalley avenue to Goffe street.....	201.4	24 in. B.	3.20	
Broadway..... ".....	63.3	15 in. C.	2.30	1,048.99
Brown street..... Water to Wooster.....	39.5	18 in. C.	2.65	
Brown street..... ".....	5.0	15 in. C.	1.95	170.55
Brown street..... ".....	482.6	15 in. C.	1.50	
Brown street..... ".....	157.3	12 in. C.	1.28	1,249.90
Canal street..... Lock to Bristol.....	610.8	60 in. B.	11.60	
Canal street..... Bristol to Munson.....	1847.8	54 in. B.	9.48	
Canal street..... Munson to Argyle.....	709.9	48 in. B.	9.00	
Canal street..... Argyle to Division.....	796.0	42 in. B.	8.00	
Canal street..... Corner of Division.....	40.4	36 in. B.	7.50	46,748.34
Canal street..... "..... Munson.....	95.0	36 in. B.	7.50	
Canner street..... Anderson to Orange.....	421.0	48 in. B.	7.50	
Canner street..... Orange to Whitney avenue.....	810.0	42 in. B.	6.75	
Canner street..... ".....	821.5	36 in. B.	6.00	17,223.80
Canner street..... Corner of Whitney avenue.....	41.4	30 in. B.	5.00	
Cedar street..... Silver to Prince.....	150.0	15 in. C.	City.	736.08
Cedar street..... Corner of Congress avenue.....	43.8	18 in. C.	2.60	164.93
Cedar street..... ".....	8.0	15 in. C.	1.90	
Center street..... Orange to Church.....	413.0	15 in. C.	....	.....

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Center street..... Church to Temple.....	186.6	15 in. C.	\$2.23	\$1,110.51
Center street..... "	171.4	12 in. C.	1.99	
Chapel street..... Union to East.....	3,200.0	24 in. C.	3.00	
Chapel street..... State to Church.....	895.0	24 in. C.	3.75	3,896.15
Chapel street..... Corner of Franklin.....	27.5	18 in. C.	....	364.87
Chapel street..... "	3.0	15 in. C.	....	
Chapel street..... " of Church.....	31.0	24 in. B.	City.	
Chapel street..... Church to College.....	925.0	24 in. C.	2.54	2,316.65
Chapel street..... College to York.....	800.0	18 in. C.	2.75	2,811.40
Chapel street..... York to Park.....	486.0	18 in. C.	....	3,150.00
Chapel street..... Park to Howe.....	43.2	18 in. C.	....	1,578.67
Chapel street..... "	200.5	15 in. C.	2.95	2,301.80
Chapel street..... "	198.8	12 in. C.	2.35	
Chapel street..... Howe to Gill.....	81.7	15 in. C.	2.30	
Chapel street..... "	594.5	15 in. C.	2.60	2,164.87
Chapel street..... Gill to Kensington.....	610.1	12 in. C.	1.70	
Chapel street..... "	5.0	18 in. C.	3.00	
Chapel street..... Kensington to Beers.....	699.2	15 in. C.	2.45	13,506.79
Chapel street..... Beers to Derby avenue.....	899.3	30 in. B.	3.90	
Chestnut street..... Water to Wooster.....	708.9	36 in. B.	6.45	
Chesnut street..... Wooster to Chapel.....	376.0	30 in. B.	4.20	5,165.78
Church street..... Corner of George.....	24.7	24 in. B.	3.50	
Church street..... George to Elm.....	1,785.0	36 in. B.	City.	
Church street..... Elm to Grove.....	953.0	36 in. B.	....	265.81
Clark street..... Corner of State.....	30.0	36 in. B.	....	6,272.40
Clark street..... " of Orange.....	32.5	30 in. B.	City.	3,349.25
College street..... George to Crown.....	35.5	15 in. V.	2.10	205.19
College street..... "	323.2	12 in. V.	3.00	110.00
College street..... Crown to Chapel.....	480.0	18 in. C.	2.20	1,097.25
				

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

39

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
College street.....Elm to Wall.....	552.6	30 in. B.	\$4.00	\$2,942.59
College street.....".....	25.3	24 in. B.	3.50	
College street.....".....	18.5	18 in. C.	3.00	
College street.....".....	57.0	15 in. C.	2.75	204.73
Collis street.....Corner of East.....	44.0	30 in. B.	4.15	
Collis street.....East to Wallace.....	366.9	30 in. B.	4.65	
Commerce street.....Water to Whiting.....	56.1	36 in. B.	4.45	2,166.27
Commerce street.....".....	107.7	30 in. B. 8 in. I.	2.20	
Commerce street.....".....	424.4	30 in. B. 4 in. I.	2.25	
Commerce street.....Whiting to Factory.....	1,119.9	24 in. B.	2.25	13,407.40
Commerce street.....Congress avenue to Factory.....	160.3	15 in. C.	1.75	
Commerce street.....Factory to Broad.....	308.4	15 in. C.	1.20	
Commerce street.....".....	117.5	12 in. C.	1.25	6,776.00
Commerce street.....".....	424.8	15 in. C.	1.90	
Congress avenue.....George to Hill.....	269.7	24 in. B. 8 in. I.	4.35	
Congress avenue.....Hill to Lafayette.....	264.4	24 in. B. 4 in. I.	3.35	1,159.32
Congress avenue.....".....	705.4	18 in. C.	2.60	
Congress avenue.....Lafayette to Cedar.....	201.5	15 in. C.	2.40	
Court street.....Olive to Artisan.....	19.8	12 in. C.	1.80	375.94
Court street.....".....	138.3	12 in. C.	City.	
Court street.....Artisan to Union.....	870.0	12 in. B.	.....	
Court street.....State to Church.....	261.5	15 in. C.	1.80	956.08
Court street.....Orange to Church.....	113.2	12 in. C.	1.45	
Court street.....".....	869.0	18 in. C.	.....	
Crown street.....State to Church.....	426.0	18 in. C.	2.75	1,933.25
Crown street.....Church to Temple.....	1,260.0	18 in. C.	.....	
Crown street.....Temple to near York.....	27.8	18 in. C.	.....	
Crown street.....Corner of High.....	133.0	18 in. C.	2.75	127.52
Crown street.....Near York.....	427.6	15 in. C.	1.94	
Crown street.....York to Howe.....	455.4	15 in. C.	1.63	
Crown street.....".....		12 in. C.	1.29	2,104.08

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Elm street..... College to High.	534.0	24 in. C.	\$3.97	2,395.71
Elm street..... High to York.....	495.0	18 in. C.	3.47	1,887.54
Elm street..... Corner of Park.....	110.1	15 in. C.	1.60	898.11
Elm street..... Park to Howe.....	297.4	15 in. C.	1.15	821.83
Elm street..... ".....	152.6	12 in. C.	.95	
Elm street..... Corner of Garden.....	32.9	18 in. C.	2.20	
Elm street..... ".....	32.7	15 in. C.	2.00	239.17
Elm street..... ".....	5.0	12 in. C.	2.00	
Evergreen Cemetery.....	649.2	24 in. C.	2.85	
Evergreen Cemetery.....	2.5	18 in. C.	2.50	2,190.98
Evergreen Cemetery.....	32.0	24 in. C.	City.	99.70
Evergreen Cemetery.....	130.0	24 in. B.	City.	
Factory street..... Corner of Oak.....	35.4	15 in. C.	2.75	158.55
Factory street..... ".....	273.8	15 in. C.	1.63	931.35
Factory street..... ".....	161.0	12 in. C.	1.42	
Fair street..... Olive to Prindle.....	27.5	24 in. B.	2.24	
Fair street..... ".....	423.8	15 in. C.	1.74	1,982.15
Fair street..... Union to Prindle.....	228.7	12 in. C.	1.49	
Foot street..... Corner of Ashmun.....	41.3	24 in. B.	1.85	415.52
Franklin street..... " of Water.....	31.2	24 in. C.	3.39	174.06
Franklin street..... Water to Wooster.....	650.0	24 in. C.	.....	.....
Franklin street..... Wooster to Chapel.....	342.0	24 in. C.	.....	.....
Franklin street..... Chapel to Greene.....	645.7	15 in. C.	2.20	2,190.98
Franklin street..... Greene to St. John.....	32.7	15 in. C.	2.45	1,025.69
Franklin street..... ".....	317.6	12 in. C.	2.20	
Franklin street..... Grand to William.....	32.9	18 in. C.	2.95	2.95
Franklin street..... ".....	438.6	15 in. C.	2.35	2.35
Franklin street..... ".....	233.3	12 in. C.	1.55	1.55
Franklin street..... Corner of State.....	46.0	15 in. C.	City.	170.59

STREET DEPARTMENT—STATEMENT NO. 1.—(CONTINUED.)

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Franklin street.....	347.4	15 in. V.	\$2.40	\$1,764.34
Franklin street.....	228.9	12 in. V.	1.75	
Garden street.....	473.8	24 in. B.	3.50	
Garden street.....	45.5	18 in. C.	2.20	2,758.34
Garden street.....	39.3	15 in. C.	2.00	
George street.....	970.0	54 in. B.	.....	.....
George street.....	2345.0	42 in. B.	.....	.....
George street.....	556.6	36 in. B.	5.45	
George street.....	59.7	30 in. B.	4.95	4,564.33
George street.....	366.3	30 in. B.	4.55	
George street.....	79.7	30 in. B.	3.90	1,907.04
Goffe street.....	29.7	15 in. C.	2.30	326.37
Grand street.....	496.0	36 in. B.	.....	243.96
Grand street.....	510.0	24 in. C.	3.25	1,345.72
Grand street.....	2460.0	24 in. C.	.....	2,425.35
Grand street.....	59.0	12 in. C.	City.	12,336.00
Grand street.....	100.0	.....	.....	39.03
Grand street.....	450.0	.....	.....	.....
Grand street.....	36.5	24 in. B.	5.97	.....
Greene street.....	30.8	30 in. B.	4.15	197.21
Greene street.....	301.2	30 in. B.	4.95	
Greene street.....	831.6	24 in. B.	4.10	6,381.12
Greene street.....	340.7	24 in. B.	City.	
Greene street.....	369.2	18 in. C.	"	3,961.46
Greene street.....	234.0	15 in. V.	2.23	
Gregson street.....	25.5	15 in. C.	1.99	892.75
Gregson street.....	293.6	12 in. C.	1.25	
Grove street.....	327.2	12 in. C.	.....	511.23

STREET DEPARTMENT--STATEMENT NO. 1.--(CONTINUED.)

43

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Grove street.....	76.0	24 in. B.	\$3.25	
Grove street.....	4.5	18 in. C.	3.00	\$443.14
Grove street.....	3.0	15 in. C.	2.20	
Grove street.....	340.7	24 in. B.	1.60	715.24
Grove street.....	268.9	24 in. B.	3.00	
Grove street.....	246.0	15 in. V.	2.25	2,537.02
Grove street.....	268.0	18 in. C.	3.40	
Hamilton street.....	42.8	15 in. C.	2.45	215.18
Hamilton street.....	5.0	15 in. V.	2.35	
Hamilton street.....	30.1	12 in. V.	1.50	810.45
Hamilton street.....	327.2	30 in. B.	2.98	
Hamilton street.....	57.4	24 in. B.	2.65	600.14
Hamilton street.....	93.5	15 in. C.	3.30	2,026.49
Hamilton street.....	458.0	12 in. C.	1.244	659.46
Hamilton Place.....	411.6	24 in. B.	3.35	
Hamilton street.....	127.4	12 in. C.	1.65	1,726.04
Hamilton street.....	394.5	24 in. B.	3.80	
Hamilton street.....	37.7	15 in. C.	2.85	324.18
Hamilton street.....	5.0	18 in. C.	City.	
Hamilton street.....	32.5	15 in. C.	"	1,874.00
Hamilton street.....	453.8	12 in. C.	"	
Hamilton street.....	8.0	15 in. C.	1.25	312.91
Hamilton street.....	199.6	18 in. C.	2.75	
High street.....	373.7	15 in. C.	2.45	2,604.70
High street.....	320.6	12 in. C.	1.76	
High street.....	167.4	18 in. C.	3.00	435.90
High street.....	56.5	15 in. C.	2.75	
High street.....	42.0	18 in. C.	2.85	1,849.25
High street.....	507.5			

STREET DEPARTMENT—STATEMENT NO. 1.—(CONTINUED.)

LOCATION.		Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Hill street	Water to Silver	13.9	48 in. B.	\$7.75	\$11,401.98
Hill street	"	109.8	45 in. B.	8.25	
Hill street	"	1030.8	42 in. B.	7.90	
Hotchkiss street	Corner of Chapel	35.1	18 in. C.	3.00	183.86
Hotchkiss street	"	4.0	15 in. C.	2.45	
Howard avenue	Corner of Davenport avenue	41.7	24 in. B.	3.55	529.96
Howard avenue	"	8.0	15 in. C.	2.30	
Howard avenue	Davenport avenue to Park street	453.5	15 in. C.	1.35	1,526.98
Howard avenue	Park to South	147.9	12 in. C.	1.15	
Howard avenue	South to Oak	287.5	15 in. V.	2.35	1,810.56
Howard avenue	"	150.0	12 in. V.	1.95	
Howe street	Corner of Chapel	55.5	30 in. B.	4.10	262.56
Howe street	" George	68.9	30 in. B.	4.95	
Howe street	"	49.6	18 in. C.	2.95	625.52
Howe street	"	5.0	15 in. C.	2.85	
Howe street	George to Elm	1650.4	30 in. B.	4.45	10,610.99
Howe street	"	395.4	24 in. B.	3.95	
Humphrey street	Wallace to State	607.1	72 in. B.	12.00	7,873.44
Humphrey street	State to Orange	1367.8	30 in. B.	5.85	
Humphrey street	"	49.4	24 in. B.	4.00	10,051.98
Humphrey street	Corner of Whitney avenue	22.4	24 in. B.	5.00	
Humphrey street	"	30.0	15 in. V.	2.50	433.46
Jefferson street	St. John to Grand	414.4	24 in. B.	3.00	
Jefferson street	"	367.1	18 in. C.	2.25	2,846.43
Kensington street	Chapel to Martin	458.8	30 in. B.	3.87	
Lafayette street	Corner of Silver	36.0	15 in. C.	2.25	2,358.10
Lafayette street	" Washington	28.9	15 in. C.	1.90	
Lafayette street	" Congress avenue	39.4	18 in. C.	2.60	762.82
Lafayette street	"	5.0	15 in. C.	1.90	

STREET DEPARTMENT—STATEMENT No. 1.—(CONTINUED.)

45

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Lafayette street.....	317.1	15 in. C.	\$2.65	\$2,372.01
Lafayette street.....	369.5	12 in. C.	2.24	8.97
Laurel street.....	473.1	60 in. B. & S.	12.00	11,381.26
Laurel street.....	333.2	72 in. B.	7.65	14,823.22
Lawrence street.....	939.6	42 in. B.	6.90	562.33
Lawrence street.....	748.4	36 in. B.	4.90	1.55
Lawrence street.....	43.1	30 in. B.	1.55	895.43
Liberty street.....	108.7	18 in. C.	1.00	11.60
Liberty street.....	5.0	12 in. C.	4.15	209.85
Lock street.....	473.5	60 in. B.	3.85	2,660.04
Lock street.....	33.7	30 in. B.	3.35	1.15
Locust street.....	315.0	24 in. B.	.90	1,087.00
Locust street.....	226.6	15 in. C.	1.90	1,772.65
Lynwood street.....	367.7	12 in. C.	1.45	5,366.05
Lynwood street.....	151.0	30 in. B. 8 in. I.	4.50	3.205.97
Lyon street.....	378.3	24 in. B. 8 in. I.	3.00	598.72
Lyon street.....	346.9	24 in. B. 4 in. I.	3.50	12,526.68
Mansfield street.....	428.0	30 in. B.	2.20	32,145.68
Mansfield street.....	49.2	18 in. C.	1.15	8.50
Mansfield street.....	719.0	12 in. C.	.90	
Martin street.....	156.9	74 in. B. & S.	6.00	
Martin street.....	517.5	67.6 in. B. & S.	12.95	
Martin street.....	33.5	74 in. B. & S.	13.50	
Martin street.....	250.5	36 in. B.	8.50	
Martin street.....	21.0			
Meadow street.....	506.9			
Meadow street.....	1021.5			
Meadow street.....	224.1			
Meadow street.....	21.2			

STREET DEPARTMENT—STATEMENT NO. 1.—(CONTINUED.)

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Meadow street.....	620.6	36 in. B.	\$3.50	\$5,968.41
Meadow street.....	699.3	30 in. B. 8 in. I.	3.25	
Mechanic street.....	285.9	54 in. B.	9.35	3,128.06
Mechanic street.....	36.2	42 in. B.	7.65	
Munson street.....	62.7	54 in. B.	9.48	1,940.89
Munson street.....	105.3	48 in. B.	9.00	
Munson street.....	103.9	24 in. B.	City.	753.04
Myrtle street.....	43.3	15 in. C.	4.85	283.51
Oak street.....	1033.2	36 in. B.	7.25	10,152.28
Oak street.....	91.2	30 in. B.	7.50	
Oak street.....	10.0	18 in. C.	2.95	.....
Oak street.....	480.0	.....	.....	
Olive street.....	438.0	24 in. B.	2.24	1,446.06
Olive street.....	133.5	12 in. C.	1.49	
Olive street.....	490.0	12 in. C.	.....	438.20
Olive street.....	1089.0	18 in. C.	2.45	3,788.70
Olive street.....	48.3	20 in. B.	3.00	
Olive street.....	568.2	15 in. V.	2.50	2,659.55
Olive street.....	47.5	12 in. C.	1.50	
Orange street.....	368.0	18 in. C.	2.25	1,351.75
Orange street.....	500.0	18 in. C.	2.25	
Orange street.....	886.0	18 in. C.	2.20	3,095.50
Orange street.....	510.1	15 in. C.	2.20	
Orange street.....	324.4	12 in. C.	1.50	2,400.08
Orange street.....	358.8	15 in. C.	1.75	
Orange street.....	75.8	12 in. C.	1.50	3,730.67
Orange street.....	432.0	18 in. C.	2.19	
Orange street.....	388.7	15 in. C.	1.75	346.50
Orange street.....	29.4	24 in. B.	3.84	
Orange street.....	37.8	18 in. C.	3.10	

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Orange street.....	148.9	15 in. C.	\$2.10	\$10,551.19
Orange street.....	187.9	15 in. C.	2.10	
Orange street.....	203.4	12 in. C.	2.40	
Orange street.....	29.0	30 in. B.	4.90	
Orange street.....	345.5	24 in. B.	3.20	376.31
Orange street.....	313.4	18 in. C.	2.85	
Orange street.....	311.4	15 in. C.	2.10	
Orange street.....	68.5	18 in. C.	3.60	
Orange street.....	10.0	15 in. C.	3.10	218.09
Orchard street.....	42.2	24 in. C.	3.50	
Orchard street.....	280.0	— in. B.	.....	
Orchard street.....	45.5	12 in. C.	City.	
Osborn street.....	370.0	42 in. B.		177.45
Park street.....	40.0	15 in. C.	2.85	
Park street.....	14.0	42 in. B.	5.20	
Park street.....	395.8	30 in. B.	3.95	
Park street.....	65.5	24 in. B.	3.50	351.52
Park street.....	430.0	24 in. B.	2.80	
Park street.....	527.4	24 in. B.	2.00	
Park street.....	39.7	36 in. B.	6.70	
Park street.....	1077.6	30 in. B.	4.95	6,987.60
Park street.....	26.6	24 in. B.	3.75	
Park street.....	22.0	18 in. C.	3.25	
Park street.....	47.0	15 in. V.	2.50	
Park street.....	300.0	— in. C.		174.96
Park street.....	39.2	18 in. C.	3.60	
Park street.....	5.0	15 in. C.	3.10	
Park street.....	626.0	36 in. B. & S.	3.65	
Park street.....	35.9	24 in. B. & S.	2.25	6,287.51
Park street.....				
Park street.....				
Park street.....				

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Prospect street.....	379.6	60 in. B.	\$8.97	\$8,350.41
Prospect street.....	545.2	30 in. B.	4.75	
Prindle street.....	18.6	15 in. C.	1.74	266.89
Prindle street.....	5.0	12 in. C.	1.49	
Rose street.....	42.0	15 in. C.	2.65	304.11
Sachem street.....	53.6	15 in. V.	2.50	193.51
Second street.....	300.0	12 in. C.	....	.....
Sherman avenue.....	39.6	18 in. C.	3.00	200.60
Sherman avenue.....	5.0	15 in. C.	2.45	
Sherman avenue.....	53.4	48 in. B.	10.00	712.82
Silver street.....	64.3	42 in. B.	7.90	613.81
Silver street.....	1305.6	36 in. B.	7.35	11,238.64
South street.....	4.1	24 in. B.	2.20	
South street.....	51.3	18 in. C.	1.85	346.39
South street.....	532.0	24 in. B.	3.35	2,749.62
South street.....	137.3	15 in. V.	2.35	
South street.....	411.0	15 in. C.	1.41	1,337.07
Spruce street.....	148.0	12 in. C.	1.35	.....
Spruce street.....	350.0	57 in. B.	....	.....
State street.....	1000.0	24 in. C.	3.75	4,279.00
State street.....	1014.3	36 in. B.	6.95	7,726.33
State street.....	12.8	30 in. B.	4.50	
State street.....	935.0	24 in. C.	3.75	4,000.77
State street.....	1866.9	66 in. B.	8.97	20,603.61
State street.....	787.0	18 in. C.	2.05	3,932.40
State street.....	36.0	18 in. C.	2.95	
State street.....	593.5	15 in. C.	1.60	1,600.30
State street.....	35.1	15 in. C.	2.70	
State street.....	309.2	12 in. C.	1.85	
Trumbull to Lock.....				
“ “.....				
Corner of Fair.....				
“ “.....				
“ of Lafayette.....				
“ of Whitney avenue.....				
E. Pearl to Quinpiac R.....				
Corner of Chapel.....				
“ “.....				
“ of Whalley avenue.....				
“ of Hill.....				
Hill to Cedar.....				
Corner of York.....				
“ “.....				
York to Park.....				
“ “.....				
George to Oak.....				
“ “.....				
Water to Whiting.....				
George to Chapel.....				
Whiting to Chapel.....				
Whiting to Chapel.....				
Chapel to Elm.....				
Humphrey to Trumbull.....				
Trumbull to Grove.....				
“ “.....				
Grove to R. R.....				
State street.....				
Elm to R. R.....				
“ “.....				

STREET DEPARTMENT—STATEMENT No. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
State street.....	103.0	12 in. C.	\$1.45	
State street.....	276.2	24 in. B.	2.65	
State street.....	197.4	24 in. B.	2.65	\$2,939.71
State street.....	217.5	15 in. C.	1.75	
State street.....	199.7	12 in. C.	1.45	
St. John street.....	32.7	36 in. B.	6.25	277.60
St. John street.....	1095.8	30 in. B.	3.90	
St. John street.....	518.2	24 in. B.	3.35	
St. John street.....	517.1	15 in. C.	2.45	11,021.75
St. John street.....	401.0	12 in. C.	1.65	
St. John street.....	40.9	15 in. C.	1.95	
St. John street.....	157.1	12 in. C.	1.85	762.28
St. John street.....	150.0	in. C.	....	.....
Summer street.....	213.4	15 in. C.	1.25	
Summer street.....	202.7	12 in. C.	1.10	88,406
Sylvan avenue.....	39.2	15 in. C.	City.	263.13
Temple street.....	58.0	24 in. B.	2.00	439.43
Temple street.....	495.0	18 in. C.	2.30	1,342.84
Temple street.....	43.7	15 in. C.	1.10	48.07
Temple street.....	925.0	18 in. C.	....	2,122.53
Temple street.....	44.3	20 in. B.	2.25	
Temple street.....	257.0	15 in. C.	1.45	1,128.43
Temple street.....	167.4	12 in. C.	1.25	
Temple street.....	256.7	15 in. C.	1.00	871.65
Temple street.....	147.0	12 in. C.	.80.	
Trumbull street.....	771.8	66 in. B.	8.97	23,739.29
Trumbull street.....	1609.3	60 in. B.	8.97	
Union avenue.....	275.7	24 in. B.	6.45	2,019.70
Union street.....	620.0	24 in. C.	....	3,945.85
Union street.....	448.6	24 in. B. 8 in. I.	City.	2,054.00

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Veto street.....	51.8	12 in. C.	\$1.50	\$121.49
Wall street.....	33.5	12 in. C.	1.50	100.01
Wall street.....	311.0	15 in. C.	3.15	1,342.18
Wall street.....	400.0	18 in. C.	2.20	1,200.00
Wall street.....	486.0	18 in. C.	.....	1,413.30
Wall street.....	330.0	15 in. C.	3.25	2,319.58
Wall street.....	204.0	12 in. C.	3.00	183.39
Wallace street.....	46.8	15 in. C.	2.45	1,524.48
Wallace street.....	668.0	18 in. C.	.....	1,199.58
Wallace street.....	191.0	15 in. C.	2.40	2,425.35
Wallace street.....	156.8	12 in. C.	1.90	1,128.45
Wallace street.....	790.0	18 in. C.	2.30	5,270.86
Wallace street.....	51.7	15 in. C.	2.25	
Wallace street.....	368.5	12 in. C.	1.90	
Wallace street.....	44.8	15 in. C.	2.75	
Wallace street.....	296.3	12 in. C.	2.35	
Wallace street.....	311.7	15 in. C.	2.75	
Wallace street.....	117.2	12 in. C.	2.35	
Wallace street.....	357.1	15 in. C.	2.75	
Wallace street.....	157.2	12 in. C.	2.35	
Wallace street.....	40.0	18 in. C.	3.10	199.71
Wallace street.....	615.1	24 in. B.	3.80	2,928.11
Wallace street.....	332.8	15 in. C.	1.95	1,787.88
Wallace street.....	325.0	12 in. C.	1.85	
Wallace street.....	97.7	18 in. C.	2.60	362.49
Wallace street.....	39.2	12 in. C.	1.65	
Wallace street.....	45.5	42 in. B.	5.95	7,272.71
Wallace street.....	1058.2	36 in. B.	5.10	

STREET DEPARTMENT—STATEMENT NO. 1.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Water street.....	8.0	36 in. B.	\$5.10	\$838.90
Water street.....	166.2	30 in. B.	4.20	
Water street.....	4.5	24 in. B.	4.20	
Water street.....	1124.8	24 in. B.	2.80	4,339.91
Water street.....	2.0	18 in. C.	2.65	
Water street.....	401.1	24 in. B.	2.24	
Water street.....	556.2	54 in. B.	9.48	1,246.12
Water street.....	29.6	54 in. B.	10.50	5720.88
Water street.....	21.9	48 in. B.	9.25	597.68
Water street.....	364.2	48 in. B.	7.75	
Water street.....	470.7	15 in. C.	1.20	
Webster street.....	383.6	30 in. B. 8 in. I.	2.87	3,674.99
Webster street.....	34.4	24 in. B.	1.85	
Webster street.....	345.0	24 in. C.	3.15	
Whalley avenue.....	44.0	15 in. C.	1.95	1,711.85
Whalley avenue.....	400.8	12 in. C.	1.62	1,172.09
Whalley avenue.....	346.0	15 in. C.	1.90	
Whalley avenue.....	637.0	48 in. B.	10.00	
Whalley avenue.....	640.3	15 in. C.	3.00	12,671.22
Whalley avenue.....	693.0	24 in. C.	4.00	
Whalley avenue.....	299.0	12 in. C.	1.50	
Whitney avenue.....	313.8	15 in. C.	2.25	576.64
Whitney avenue.....	242.5	12 in. C.	1.70	
Whitney avenue.....	43.4	24 in. B.	4.00	
Whitney avenue.....	34.9	20 in. B.	3.80	448.74
Whitney avenue.....	431.5	18 in. C.	2.43	
Whitney avenue.....	1370.0	15 in. V.	2.50	
Whitney avenue.....	231.9	15 in. V.	2.50	7,355.81
Whitney avenue.....	390.9	12 in. V.	1.75	
Whitney avenue.....				

STREET DEPARTMENT—STATEMENT NO. I.—CONTINUED.

LOCATION.	Length in feet.	Size and Material.	Contract price per foot.	Total Cost.
Whitney avenue.....	37.3	30 in. B.	5.00	10,547.50
Whitney avenue.....	964.9	24 in. B.	4.00	
Whitney avenue.....	596.5	15 in. V.	3.00	
Whitney avenue.....	327.0	24 in. B.	4.00	1,441.52
Winthrop avenue.....	460.5	24 in. B.	2.00	
Winthrop avenue.....	935.5	54 in. B.	12.00	
Winthrop avenue.....	1321.2	48 in. B.	10.00	29,028.31
Wooster place.....	370.0	18 in. C.	....	
Wooster street.....	2660.0	24 in. C.	....	
Wooster street.....	9.0	30 in. B.	4.20	156.77
Wooster street.....	19.0	24 in. C.	3.50	
Wooster street.....	668.0	15 in. C.	3.40	
York street.....	45.3	24 in. B.	2.20	836.13
York street.....	312.0	18 in. C.	1.85	
York street.....	550.0	42 in. B.	....	
York street.....	1812.0	24 in. C.		387.89
York street.....	946.0	18 in. C.	....	
York square.....	457	15 in. C.	City.	

STREET DEPARTMENT—STATEMENT No. 2.

SEWERS BUILT, AND SEWERS IN USE.

Size and Material.	Length of Sewers Constructed.		Length of Sewers in Use.	
	Feet.	Miles.	Feet.	Miles.
74 in. Brick and Stone.	731.	.138	731.	.138
72 in. Brick	940.3	.178	940.3	.178
67.6 in. Brick and Stone.	1,021.5	.193	1,021.5	.193
66 in. Brick	2,638.7	.5	2,638.7	.5
63.3 in. Brick and Stone.	1,526.2	.289	1,526.2	.289
60 in. Brick	3,546.3	.672	3,546.3	.672
57 in. Brick	710.	.134	350.	.066
54 in. Brick	11,756.4	2.226	11,756.4	2.226
48 in. Brick	4,050.4	.767	4,050.4	.767
45 in. Brick	199.8	.038	199.8	.038
42 in. Brick	7,062.	1.338	7,062.	1.338
36 in. Brick	13,591.3	2.574	13,573.3	2.571
30 in. Brick	14,198.4	2.689	14,198.4	2.689
24 in. Brick	19,766.5	3.744	19,766.5	3.744
24 in. Cement	22,194.4	4.204	20,016.4	3.791
20 in. Brick	127.5	.024	127.5	.024
18 in. Cement Pipe...	23,036.	4.363	21,625.1	4.096
15 in. Cement Pipe...	23,976.4	4.541	23,976.4	4.541
15 in. Vitrified Pipe...	5,157.2	.977	5,157.2	.977
12 in. Cement Pipe...	13,335.8	2.525	13,335.8	2.525
12 in. Vitrified Pipe...	2,577.2	.488	2,577.2	.488
12 in. Brick	870.	.165	870.	.165
Unknown.....	2,110.	.4	1,760.	.333
Total.....	175,123.3	33.167	170,806.4	32.349

STREET DEPARTMENT—STATEMENT No. 3.

WORK ON SEWERS IN 1876.

STREET.	CONTRACTOR.	Length.	Size and Material.	Cost of Sewer.	Cost of Man-holes, etc.	Total Cost.
Broad street.... Lafayette to Rose Court.....	Davis & Fowler	155.5	15 in. C. P.	\$186.60 }	\$339.21	578.11
Broad street.... "	"	52.3	12 in. C. P.	52.30 }	.....	493.08
Derby avenue West River to Whittemore avenue..	City.....	402.6	48 in. B.	.....	.....	824.83
Elm street Park to Howe.....	Davis & Fowler	297.4	15 in. C. P.	342.01 }	337.85	39.03
Elm street "	"	152.6	12 in. C. P.	144.97 }	.....	2,537.02
Grand street..... Artisan to R. R.....	City.....	59.	12 in. C. P.	.....	.....	1,810.56
Grove street..... Temple to College.....	Davis & Fowler	268.9	24 in. B.	806.70 }	1,176.82	895.43
Grove street..... "	"	246.	15 in. V. P.	553.50 }	.....	1,087.00
Howard avenue... South to Oak	Lawrence O'Brien...	287.5	15 in. V. P.	675.53 }	842.43	598.72
Howard avenue... "	"	150.	12 in. V. P.	295.50 }	.....	12,526.68
Liberty street..... Silver to R. R.....	Davis & Fowler	108.7	18 in. C. P.	168.49 }	721.94	6,287.51
Liberty street..... "	"	5.	12 in. C. P.	5.00 }	.....	2,749.62
Lynwood street... Martin to Elm.....	Lawrence O'Brien...	367.7	15 in. C. P.	422.86 }	528.24	.....
Lynwood street... "	"	151.	12 in. C. P.	135.90 }	.....	.....
Martin street.... Park to Lynwood.....	"	256.5	15 in. C. P.	294.98 }	284.84	.....
Martin street.... "	"	21.	12 in. C. P.	18.90 }	.....	.....
Meadow street Extension—main outlet.....	Matthew Kehoe.....	506.9	74 in. B. & S.	3,041.22 }	9,485.46	.....
Portsea street.... Meadow to Water	Grandfield & Brennan	626.	36 in. B. & S.	2,284.90 }	3,921.84	.....
Portsea street.... "	"	35.9	24 in. B. & S.	80.77 }	.....	.....
South street..... York to Park.....	Lawrence O'Brien...	532.	24 in. B.	1,782.20 }	644.76	.....
South street.... Park to Howard avenue.....	"	137.3	15 in. V. P.	322.66 }	.....	.....

STREET DEPARTMENT—STATEMENT No. 4.
SEWER CONTRACTS COMPLETED IN 1876.

STREET.	Size and Material.	Average Cut.	Length.	Nature of Excavation.	Contract price per foot.
Meadow street Extension—main outlet.....	74 in. Brick & Stone,	....	566 9	Built on Pile foundation.....	\$6.00
Portsea street...Meadow to Water.....	36 in. " "	....	626.0	" "	3.65
Portsea street... "	24 in. " "	....	35.9	" Grillage.....	2.25
Grove street....Temple to Hillhouse avenue..	24 in. Brick,	9.6 feet,	268.9	Sand and Gravel.....	3.00
South street....York to Park.....	24 in. " "	12.0 "	532.0	Sand.....	3.35
Liberty street....Silver to Railroad..	18 in. Cement Pipe,	7.6 "	108.7	Sand, Quicksand, and Water..	1.55
Broad street....Lafayette to Rose Court.....	15 in. " "	11.4 "	155.5	Sand... ..	1.20
Elm street.....Park to Howe.....	15 in. " "	11.7 "	297.4	"	1.15
Lynwood street..Martin to Elm.....	15 in. " "	10.2 "	367.7	"	1.15
Martin street....Park to Lynwood....	15 in. " "	11.7 "	256.5	"	1.15
Grove street....Hillhouse av. to College street.	15 in. Vitrified Pipe,	10.8 "	246.0	"	2.25
Howard avenue..South to Oak street.	15 in. " "	10.9 "	287.5	"	2.35
South street....Park to Howard avenue.....	15 in. " "	11.5 "	137.3	"	2.35
Broad street....Lafayette to Rose Court.....	12 in. Cement Pipe,	11.0 "	52.3	"	1.00
Elm street.....Park to Howe.....	12 in. " "	10.7 "	152.6	"	.95
Liberty street....Railroad to Minor street.....	12 in. " "	7.0 "	5.0	Sand and Water.....	1.00
Lynwood street..Martin to Elm.....	12 in. " "	10.1 "	151.0	Sand.....	.90
Martin street....Corner of Lynwood.....	12 in. " "	11.5 "	21.0	"	.90
Howard avenue..South to Oak street.....	12 in. Vitrified Pipe,	10.3 "	150.0	"	1.95

STREET DEPARTMENT—STATEMENT No. 5.
COMPARISON OF BIDS ON SEWERS ACCORDING TO ESTIMATES OF QUANTITIES.

Location of Sewer.	Highest Bidder.	Amount.	Lowest Bidder.	Amount.	Difference.
Broad and Liberty streets...	Matthew Kehoe.....	\$1,282.50	Davis & Fowler.....	\$899.50	\$383.00
Elm street.....	Grandfield & Brennan.....	945.50	Davis & Fowler.....	670.50	275.00
Grove street.....	Lawrence O'Brien.....	2,321.50	Davis & Fowler.....	2,198.75	122.75
Martin and Lynwood streets.	Grandfield & Brennan.....	1,784.50	Lawrence O'Brien.....	1,327.00	457.50
Meadow street—main outlet..	Grandfield & Brennan.....	14,780.00	Matthew Kehoe.....	11,295.00	3,485.00
Portsea street.....	Matthew Kehoe.....	7,280.00	Grandfield & Brennan.....	5,724.00	1,556.00
South street and Howard ave.	Matthew Kehoe.....	4,157.70	Lawrence O'Brien.....	4,048.50	109.20
		\$32,551.70		\$26,163.25	\$6,388.45

STREET DEPARTMENT—STATEMENT No. 6.

AVERAGE OF THE CONTRACT PRICE PER FOOT OF EACH OF THE RESPECTIVE SIZES OF SEWERS BUILT DURING THE YEAR 1876.

Size.	Material.	Average Contract price per foot.
74 inches.....	Brick and Stone.....	\$6.00
36 inches.....	Brick and Stone.....	3.65
24 inches.....	Brick and Stone.....	2.25
24 inches.....	Brick . . . ".....	3.23
18 inches.....	Cement Pipe.....	1.55
15 inches.....	Cement Pipe.....	1.16
12 inches.....	Cement Pipe.....	.93
15 inches.....	Vitrified Pipe.....	2.31
12 inches.....	Vitrified Pipe.....	1.95

STREET DEPARTMENT—STATEMENT No. 7.

STREETS PAVED IN 1876.

Street.	Location.	Contractor.	Kind of Pavement.	Length in feet.	Number of Square Yards.	Cost per Square Yard.	Total Cost.
Dixwell avenue....	Broadway to Bristol....	Chas. W. Blakeslee....	Telford.....	879	3,866.79	\$1.18	4,562.81*
Gregson.....	Crown to Center.....	City (Relaid).....	Cobble	200	364.44	.54	196.80

* Commenced in 1875.

STREET DEPARTMENT—STATEMENT No. 8.

PAVEMENTS REPAIRED DURING 1876.

Location.	Cost.
Brewery street, ...	\$72.50
Broadway, ...	324.36
Chapel street (wood), ...	657.25
Church street, ...	1,522.98
Congress avenue, ...	65.50
Crown street, ...	159.13
Custom House Square, ...	856.70
Elm street, ...	401.30
Orange street, ...	1,185.70
Union street, ...	40.81
Whalley avenue, ...	4,499.84
Wooster street, ...	645.10
York street, ...	777.90
	\$11,209.07

STREET DEPARTMENT—STATEMENT No. 9

STREETS GRADED IN 1876.

LOCALITY.	CONTRACTOR.	Length in feet.	Number of Cubic Yards.	Cost per Yard.	Total Cost.
Castle street.....	Ferry Path to Main.....	440	.....	...	\$795.00
Chapel street.....	Approach to Bridge over Mill River.....	.....	.....	...	1,007.72
Commerce street.....	Broad to Water	2,300	11,435	\$0.22½	2,582.10
Davenport avenue.....	West end .....	.....	.....	...	599.50
Derby avenue.....	" .....	.....	.....	...	2,062.16
Goffe street.....	Orchard to Osborn avenue.....	4,170	.....	...	12,345.27
James street.....	.....	.....	.....	...	3,432.03
Lawrence street.....	State to Nicoll.....	700	.....	...	204.00
Lombard street.....	Ferry to Ferry Path.....	1,630	.....	...	186.00
Minor street	Cedar to Lafayette.....	500	.....	...	161.50
Portsea street.....	Liberty to West Water.....	840	.....	...	328.50
Quinnipiac street	Bridge approach (shells).....	350	.....	...	.....
Quinnipiac street.....	" (earth).....	.....	.....	...	.....
Quinnipiac street.....	" .....	.....	.....	...	.....
Rose Court.....	Rose to Broad.....	.....	.....	...	not completed.
Tyler street.....	Oak street southerly.....	380	.....	...	41.84
View street.....	State street northerly.....	800	523	.08	180.00
Washington street.....	West to West River.....	2,240	.....	...	90.00
West River.....	Bridge approaches.....	1,200	6,239	...	.....
Whiting street.....	Hill to Meadow.....	336	11,119	.22	2,446.18
			.....	...	105.00

STREET DEPARTMENT—STATEMENT No. 10.
SHOWING THE HIGHEST AND LOWEST AMOUNTS OF BIDS FOR STREET GRADING.

STREET.	HIGHEST BID.		Amount.	LOWEST BID.		Amount.
	CONTRACTOR.			CONTRACTOR.		
Rose Court.....	Robert Stevens.....		\$57.53	John Coyne.....		\$41.84
West River Bridge approaches..	William Montague.....		2,626.86	D. A. Blakeslee.....		2,446.18
			\$2,684.39			\$2,488.02

Difference in amounts, \$196.37.

STREET DEPARTMENT—STATEMENT No. II.

STREETS TURNPIKED DURING 1876.

Streets.	Cost.	Streets.	Cost.
Adeline street, . . .	\$20.00	Lamberton street, . . .	\$10.00
Anderson street, . . .	133.50	Leonard street, . . .	7.50
Ashmun street, . . .	88.50	Liberty street, . . .	87.50
Asylum street, . . .	45.00	Lynwood street, . . .	45.00
Broad street, . . .	43.00	Martin street, . . .	195.00
Carlisle street, . . .	20.00	Monson street, . . .	40.00
Cedar street, . . .	15.00	Morris street, . . .	30.00
Chapel street, . . .	86.00	Nash street, . . .	41.00
Charles street, . . .	23.00	Norton street, . . .	140.00
Cliff street, . . .	66.00	Oak street, . . .	210.00
College street, . . .	128.50	Olive street, . . .	15.00
Columbus street, . . .	134.50	Orchard street, . . .	42.50
Congress avenue, . . .	168.00	Peck street, . . .	22.50
Crown street, . . .	11.25	Poplar street, . . .	75.00
Division street, . . .	171.50	Punderson street, . . .	30.00
Dixwell avenue, . . .	111.00	Prince street, . . .	12.50
Dwight street, . . .	57.75	Prospect street, . . .	12.00
Elm street, . . .	75.00	Sea street, . . .	30.00
Ferry (Shelling), . . .	60.00	Silver street, . . .	10.00
Ferry Path, . . .	12.25	South street, . . .	42.50
Fifth street, . . .	50.00	Spring street, . . .	33.00
Frank street, . . .	19.00	Stevens street, . . .	50.00
Garden street, . . .	52.50	Summer street, . . .	57.50
George street, . . .	25.00	Sylvan avenue, . . .	98.00
Gregson street, . . .	7.50	Vernon street, . . .	37.50
Hazel street, . . .	60.00	Vine street, . . .	20.00
Highland street, . . .	132.00	Washington street, . . .	55.00
Hill street, . . .	30.00	Water street, East (stone), . . .	315.00
Howard avenue, . . .	70.00	Water street, West, . . .	15.00
Howe street, . . .	110.00	West street, . . .	20.00
Jackson street, . . .	22.50	Whitney avenue, . . .	30.00
Kimberly avenue, . . .	27.00	Winthrop avenue, . . .	331.00
Lafayette street, . . .	66.00	Total, . . .	\$4,301.75

STREET DEPARTMENT—STATEMENT No. 12.

WORK ON BRIDGES DURING 1876.

LOCATION.	WORK DONE.	Cost.
Barnesville.....	Repairs.....	\$267.26
Chapel street (west).....	Repairs.....	304.02
Chapel street.....	Repairs.....	1,899.76
Congress avenue, at West River.....	New abutment and approaches.....	9,919.76
Kimberly avenue.....	Repairs.....	340.54
Lewis.....	Soundings.....	12.25
Neck.....	Repairs.....	97.85
Oak street.....	Repairs.....	67.87
Quinnipiac Bridge (new).....	Approach.....	13,148.06
Quinnipiac Bridge, Grand street.....	Repairs.....	91.50

STREET DEPARTMENT—STATEMENT No. 13.

SHOWING SIDEWALKS COMPLETED DURING 1876.

Streets.	Between what points.	Side.	Material.
Arch,	Congress ave. to Columbus,	West.	Brick.
Button,	Rosette to Lamberton,	Both.	Curb.
Clay,	Blatchley ave. to Ferry,	Both.	Curb.
College,	Elm to Grove,	West.	relay.
Columbus,	Howard ave. to Cedar,	North.	Curb.
Columbus,	Howard ave. to Lafayette,	South.	relay.
Columbus,	Cedar to Lafayette,	North.	relay.
Compton,	Mansfield to Winchester ave.,	South.	Concrete.
Cottage,	Orange to Foster,	South.	Concrete.
Davenport ave.,	Congress ave. to West,	South.	Curb.
Dixwell ave.,	Admiral to Gregory,	East.	Concrete.
East,	Myrtle to State,	West.	Concrete.
Edwards,	Livingstone to Whitney ave.,	North.	Concrete.
Foote,	Winter to Church property,	South.	Curb.
Foster,	Lawrence to Cottage,	West.	Concrete.
George,	Day to Elliott,	South.	Brick.
Grand,	East to R. R. crossing,	South.	Brick.
Greenwood,	Sylvan ave. to Oak,	West.	Brick.
Hamilton,	Chapel to Greene,	East.	repairs.
Howard ave.,	Putnam to Spring,	East.	Curb.
Howard ave.,	Putnam to Spring,	East.	Brick.
Howard ave.,	Putnam to Rosette,	West.	Brick.
Humphrey,	Orange to Whitney ave.,	South.	Curb.
Lamberton,	Cedar to Morris,	Both.	Curb.
Leonard,	Bradley to Summer,	East.	Brick.
Liberty,	Washington to Prince,	West.	Brick.
Lombard,	Ferry st. to Ferry Path,	Both.	Curb.
Mansfield,	Sachem to Compton,	West.	Concrete.
Meadow,	Water to Columbus,	West.	Plank.
Mill,	Saltonstall ave. to Wolcott,	East.	Concrete.
Minor,	Cedar to Liberty,	South.	Curb.
Nash,	Edwards to Willow,	Both.	Curb.
Nash,	Edwards to Willow,	West.	Concrete.
Nash,	Edwards to Eagle,	East.	Concrete.
Oak,	Congress ave. to Broad,	Both.	relay.
Oak,	York to Winthrop ave.,	Both.	Brick—new & relay.
Poplar,	Grand to Exchange,	Both.	Concrete.
Portsea,	Liberty to West Water,	Both.	relay.

Shelton ave.,	Dixwell ave. to City line,	Both.	Curb.
Silver,	Lafayette to Liberty,	Both.	Brick.
State,	Edwards to James,	Both.	Curb.
Summer pl.,		Both.	Curb.
Summer st.,	Franklin to Leonard,	South.	Brick.
Union,	Fair to Water,	Both.	relay.
West Portsea,	Washington to Frank,	Both.	Brick.
Whitney ave.,	Humphrey to Edwards,	East.	Concrete.
York Square pl.,	Ashmun to York sq.,	South.	Concrete.
York st.,	South to Oak,	East.	Brick.

Total length, 56,843 feet, or $10\frac{3}{4}$ miles.

STREET DEPARTMENT—STATEMENT No. 14.

SHOWING NEW CROSSWALKS LAID DURING THE YEAR 1876.

Street.	Location.	Side.
Broad, ...	Across George, ...	West.
Broad, ...	Across Rose Court, ...	South.
Center, ...	Across Church, ...	North.
Center, ...	Across Temple, ...	South.
Chapel, ...	Across Union, ...	South.
Chapel, ...	Across Union, ...	North.
Charles, ...	Across Dixwell avenue, ...	North.
County, ...	Across Whalley avenue, ...	East.
Columbus, ...	Across Water, ...	North.
Dixwell avenue, ...	Across Gregory, ...	East.
East, ...	Across Walnut, ...	West.
East, ...	Across Laurel, ...	West.
Franklin, ...	Across Summer, ...	West.
Howard avenue, ...	Across Spring, ...	West.
Laurel, ...	Across East, ...	South.
Lawrence, ...	Across Foster, ...	North.
Meadow, ...	Across Union avenue, ...	East.
Meadow, ...	Across Water, ...	West.
Meadow, ...	Across Columbus, ...	West.
Nash, ...	Across Edward, ...	West.
Nicoll, ...	Across Edward, ...	East.
Oak, ...	Across Tyler, ...	North.
Oak, ...	Across Tyler, ...	South.
South, ...	Across York, ...	North.
Stevens, ...	Across Davenport avenue, ...	East.
Summer, ...	Across Franklin, ...	South.
Summer, ...	Across Leonard, ...	South.
Water, ...	Across Columbus, ...	West.
West, ...	Across Congress avenue, ...	East.
Whitney avenue, ...	Across Humphrey, ...	East.
Whitney avenue, ...	Across Edward, ...	East.
Whiting, ...	Across Commerce, ...	South.
Winthrop avenue, ...	Across Whalley avenue, ...	West.
Wolcott, ...	Across Ferry, ...	North.

			Feet.
George street, . .	corner of York, ...	30	
“ “ . .	Howe, ...	39	
“ “ . .	Orchard, ...	39	
“ “ . .	Winthrop avenue, ...	38	
Goffe street, . .	Sperry, ...	43	
“ “ . .	Orchard, ...	35	
“ “ . .	Winthrop avenue, ...	44	
“ “ . .	Norton, ...	55	
Grand street, . .	Front, ...	12	
“ “ . .	Atwater, ...	32	
“ “ . .	Poplar, ...	21	
“ “ . .	James, ...	21	
“ “ . .	East, ...	14	
“ “ . .	Franklin, ...	19	
“ “ . .	Olive, ...	21	
Grove street, . .	Church, ...	21	
“ “ . .	College, ...	29	
“ “ . .	York, ...	45	
Howard avenue, . .	Columbus, ...	33	
“ “ . .	Rosette, ...	26	
“ “ . .	Third, ...	21	
James street, . .	Market, ...	17	
Oak “ . .	Howe, ...	39	
“ “ . .	Orchard, ...	34	
“ “ . .	Winthrop avenue, ...	32	
Orange street, . .	Audubon, ...	19	
“ “ . .	Bradley, ...	23	
“ “ . .	Humphrey, ...	22	
“ “ . .	Lawrence, ...	19	
“ “ . .	Canner, ...	26	
Prospect street, . .	Lock, ...	30	
“ “ . .	Division, ...	131	
Shelton avenue, . .	Munson, ...	45	
“ “ . .	Division, ...	53	
“ “ . .	Bassett, ...	58	
State street, . .	East, ...	18	
“ “ . .	Pearl, ...	23	
“ “ . .	Grove, ...	18	
Washington street, . .	Putnam, ...	26	
Whalley avenue, . .	Dwight, ...	43	
“ “ . .	Sherman avenue, ...	46	
“ “ . .	Norton, ...	47	
“ “ . .	Pendleton, ...	47	
Whitney avenue, . .	Sachem, ...	36	
“ “ . .	Edwards, ...	41	
“ “ . .	Cold Spring, ...	34	
“ “ . .	Rock Lane, ...	38	
Winchester avenue, . .	Munson, ...	42	
“ “ . .	Division, ...	47	

STREET DEPARTMENT—STATEMENT No. 16.

SHOWING LIENS PLACED UPON PROPERTY DURING 1876.

Name.	Location.	Amount.
Fellowes, Richard S., . . .	Humphrey street, ...	\$352.17
Healy, Bartholomew, . . .	Fair street, corner Union, ...	6.19
Isham, J. G., ...	Dixwell avenue, ...	1.14
Maher, Catherine, ...	66 East street, ...	10.36
Miller, John, ...	Union street, ...	10.12
Reilly, Bernard, ...	Congress avenue, ...	1.24
Read, Theodore, ...	Broadway, ...	5.28
Read, Theodore, ...	Portsea street, ...	24.67
Starr, John, ...	Congress avenue, ...	24.25
Strouse, Paulena and Isaac,	Oak street, ...	149.58
Strouse, Paulena and Isaac,	Oak street, ...	275.07
Whitmore, Harriett, . . .	Martin, corner Lynwood street, . .	8.25

REPORTS
OF THE
STREET DEPARTMENT,
CITY OF NEW HAVEN, CONN.,

1877.

BOARD OF ROAD COMMISSIONERS.

Chairman.

JOHN B. ADRIANCE.

Term expires Feb. 1, 1878.

Residence, 56 Howe st.

JOHN P. TUTTLE.

Term expires Feb. 1, 1878.

Residence, 120 Howe st.

MINOTT A. OSBORN.

Died in office, October, 1877.

WILLIS G. JUDSON.

Term expires Feb. 1, 1879.

Residence, 95 Chapel st.

PHILO CHATFIELD.

Term expires Feb. 1, 1880.

Residence, 19 Lyon st.

FRANCIS DONNELLY.

Term expires Feb. 1, 1880.

Residence, 101 Middletown ave.

Clerk.

FRED. H. WALDRON.

Term expires Nov. 9, 1879.

Residence, 105 Howe st.

Office, Room No. 9, City Hall. Regular meetings every Thursday evening.

REPORT
OF THE
BOARD OF
ROAD COMMISSIONERS.

To the Honorable Court of Common Council :

I have the honor to submit herewith the annual report of the Board of Road Commissioners for 1877.

Previous to this year these reports have closed on the last day of each year, but in accordance with suggestions from his Honor the Mayor, this and future reports will close November 31st, in order to have them presented to your honorable body at your first meeting in January.

The amount of work done in this Department has been much less than during a number of preceding years, owing to the lack of funds. The appropriations for this Department were much smaller than any year since 1869, consequently much needed work has been left undone, and some orders from your honorable body have not been carried out.

Your honorable body has transmitted to this Board during the time above specified 74 orders for execution, classified as follows: 35 for grading, curbing, and paving sidewalks; 12 for cobbling gutters; 4 for opening, widening, and extending streets; 5 for Telford pavements; 4 for grading streets; 3 for sewers, and 11 miscellaneous.

The following named layouts of streets were adopted by this Board, after full hearings of parties in interest, and transmitted to your honorable body for adoption :

For Winthrop avenue, widening from Oak street to about 400 ft. south of Sylvan avenue.

For Hill street.

For Grand street, from Perkins to Front street.

For the extension of Osborn avenue, from Blake street to Whalley avenue.

For the widening of Cedar street from York to Broad street.

For Canal street, from Munson to Prospect street.

For straightening of View street at northerly end.

For East Water street, from Union to Bridge street.

For Quinnipiac bridge approach.

SEWERS.

Sewers have been constructed as follows :

In Whitney avenue, from Canner to Highland streets.

In Highland street, from Whitney avenue to St. Francis' Orphan Asylum.

In Franklin street, from Chapel to Water street, and in Temple street, from Chapel to George street.

The Franklin street sewer was constructed to take the place of the old sewer, which had become unserviceable by reason of breaking, and not having the proper grade, it caused the water to set back into the cellars adjoining.

The Temple street sewer was a part of the system to relieve the Church street sewer, it intercepting and taking the sewage matter of the Chapel and Crown street sewers, above Temple street.

The total length of these sewers is $4,191\frac{1}{100}$ feet, which, added to those already constructed, makes a total length of $32\frac{889}{1000}$ miles of sewers at present in use in the city, after deducting 0.254 miles discontinued in Franklin and Temple streets.

PAVEMENTS.

New pavements have been constructed in Olive street from Grand street to the R. R. bridge, on Orange street from George to Crown street, and on St. John street from Olive to East street.

The length of these new pavements is 3,500 feet, making a total length of paved streets in the city at the present time of 12.769 miles.

Some repairs have been made on the paved streets during the year, at a cost of \$450.35.

The Board have orders for paving Temple street, from Crown to Chapel street, and for East street from Greene to St. John street, which will be commenced early in the spring.

In accordance with orders from your honorable body, this Board caused State street, from Neck bridge northerly about 477 feet, averaging 17 feet in width, to be hardened with stone from East rock, at a cost of \$300. The depth of this work is about six inches, which makes a substantial and durable roadway.

BRIDGES.

The most important work under this head, is the completion of the retaining walls of the new Quinnipiac bridge, and of the new bridge over West river at Congress avenue.

The amount expended on the retaining walls, filling, fences, etc., to the Quinnipiac bridge this year has been \$5,492.63, which, added to the amount expended last year, makes a total of \$18,640.69 paid by the city since the completion of the bridge.

The abutments and center pier have required some repairs, which has been done, the expense of which has been shared equally between the city of New Haven, and the town of East Haven.

There has been no action on the part of this Board towards constructing a new bridge in place of the present structure, known as Lewis bridge, as there has been no appropriation made for that purpose.

The order for constructing the bridge at DeWitt street, over the tracks of the N. Y., N. H. & H. R. R. tracks, has not been carried out for the want of funds.

Considerable work has been done in and around the public parks.

A new concrete walk has been laid on the old green, from Trinity church to the corner of Elm and College streets, at a cost of \$353.86.

The concrete roadway in front of the Center church has been relaid, at a cost of \$106.90.

By a reference to statement No. 8, it will be seen that the item of grading is not as large as some of the previous years.

The largest amount of grading was done on Commerce street, Congress avenue, and Davenport avenue.

The constructing of the new bridge over West river rendered the grading of the last two named avenues necessary. After establishing the grade, and a portion of the work had been completed, this Board received orders from your honorable body to change the grade by filling up the hollow, and cutting down the hill near Bond street; this also necessitated a relay of the walks and cobble gutters, and resetting the curbs.

The grading of Commerce street is now substantially completed.

There have been 3,229 cubic yards of stone crushed at the crushing works at Westville during the season, under the supervision of this Board.

Early in the spring the Selectmen of the town of New Haven were given the use of the crushing works, for the purpose of procuring stone for repairing the roads in Westville. The town paid the expense of crushing these stones; the amount of work done, or yards of stone crushed, this Board have no means of telling.

The total amount expended at these works during the past eleven months has been \$4,792.13.

There have been 686 permits issued for excavating in streets for the purpose of connecting with gas mains, water mains, and public sewers, for which there has been received and deposited with the Collector of Taxes \$988.00.

In October last Commissioner Minott A. Osborn died.

Mr. Osborn was appointed Road Commissioner in December, 1874, for one year, and was reappointed to that position December 8, 1875, for three years.

Upon the receipt of the news of Commissioner Osborn's death, a special meeting of the Board of Road Commissioners was called, and the following resolution was adopted:

WHEREAS, This Board having received the sad intelligence of the decease of Minott A. Osborn, one of its members, those who survive him feel that they have lost a wise counsellor, a true friend, and a public benefactor, therefore—
Resolved, That it is but just tribute to his memory to say, that while we regret his decease, we mourn for one who was devoted to the trusts reposed in him as

a public officer, always studying its best interests, and fearless in doing what he considered right and just. Personally he was worthy of our regard and esteem.

Resolved, That in the death of Minott A. Osborn, the public have lost a worthy officer, and an estimable citizen, and the works which he has left, are monuments to the memory of a just man and a public benefactor.

Resolved, That this Board deeply sympathize with the family of the deceased in this their great affliction with which it has pleased Divine Providence to visit them.

Resolved, That this Board attend the funeral of our late associate, and these resolutions be entered in full upon the records, and a copy forwarded to the family of the deceased.

Respectfully submitted in behalf of the Board,

FRED. H. WALDRON, *Clerk*

NEW HAVEN, CONN., January 10, 1878.

REPORT
OF THE
CITY SURVEYOR,
1877.

CITY ENGINEER DEPARTMENT.

1877.



OFFICE: Room No. 9, City Hall.

DRAUGHTING ROOM: Room No. 18, City Hall.

CHARLES E. FOWLER, City Surveyor.

ALBERT B. HILL, 1st Assistant Engineer.

CHARLES A. FERRY, Assistant Engineer.

In charge of Sewerage work.

CASSIUS W. KELLY, Assistant Engineer.

In charge of Street work.

F. FLOYD WELD, Assistant Engineer.

In charge of Surveys, Maps, and Records.

REPORT
OF THE
CITY SURVEYOR.

To the Honorable Board of Road Commissioners :

I have the honor to submit the following report of the work of the City Engineer Department for the year 1877 :

SEWERAGE.

The amount of sewerage work performed during the year is not as large as in preceding years, although some portions of it are quite important.

A new sewer has been constructed in Franklin street from Chapel street to Water street, to replace the one built before the adoption of our present sewerage system. The old sewer was very defective in design, grade, and construction, and in times of heavy storms caused a great deal of annoyance and damage to the owners of adjoining property. With an increased size, greater depth, and true grades, it is now believed that the new sewer will obviate the trouble before experienced.

A new sewer has been constructed in Temple street from Chapel street to George street, intercepting the sewers in Chapel and Crown streets. This sewer was one of the changes called for in the report on our system of sewerage, it being designed for the purpose of relieving the sewer in Church street, between the same points, which, in times of heavy storms, was incapable of carrying off the amount of drainage turned into it. The new sewer furnishes an addi-

tional outlet for the territory drained, and the two together are believed to be of sufficient capacity to perform the duty required.

SEWERS BUILT.

At the commencement of the year 1877, there were 32.349 miles of sewers in actual use. During the year there was built

2557.5	feet of sewer,	30	inches in diameter.
1101.4	"	"	24 "
511.0	"	"	15 "
22.0	"	"	12 "

making a total length of 4191.9 feet, or 0.794 miles.

In the building of the sewers in Franklin and Temple streets, 1,338.5 feet, or 0.254 miles, were taken up or destroyed, so that the net increase during the year was but 2,853.4 feet, or 0.540 miles. This, added to the length in use at the beginning of the year, gives a total length, at the present time, of 32.889 miles of sewers in actual use.

CONDITION OF SEWERS.

Our sewers are, as a general thing, in good condition. In some cases a little cleaning and flushing is rendered necessary; a work that is performed by our Inspectors during the winter months, or when not otherwise employed.

A more systematic plan for the cleaning of catch-basins, and the re-filling of them with water, is urgently needed, and the subject should receive early attention from the Board.

MAPS.

The sewer maps, showing the size, location, and depth of the sewer, location of house connections, manholes, basins, culverts, etc., are finished up as soon after the completion of the work as other duties will allow. During the winter season an opportunity is given, and improved, for completing the unfinished work of the preceding season.

HOUSE DRAINAGE.

Considerable space was given to this subject in my report for the year 1876, to which I again respectfully call attention. The subject is one of vital importance, and I trust that it may soon receive the official attention that it deserves, and that some very needed reforms, in the usual way of carrying out such work, may soon be instituted.

STREETS.

The work upon the streets that comes more particularly under the direction of this Department is mostly contract work, consisting of the paving of streets and gutters, grading, sidewalk work, etc.

STREET PAVEMENTS.

The total length of street pavements in use at the beginning of the year 1877 was 12.106 miles.

During the year there was added 0.663 miles of Telford pavement, making the total length in use January 1st, 1878, to be 12.769 miles, or a little less than ten per cent. of the total length of streets in the city limits.

This amount is divided among the following different kinds :

Telford pavement,	.	.	.	.	9.193 miles.
Belgian "	.	.	.	.	2.227 "
Wood "	.	.	.	.	0 558 "
Concrete "	.	.	.	.	0.308 "
McAdam "	.	.	.	.	0.322 "
Cobble, "	.	.	.	.	0.161 "
Total,	.	.	.	.	12.769 "

The Telford pavements laid during the year were done at a remarkably low price, and less than the same work has cost in any previous year. The character of the work is, however, equal, if not superior to that done in former years.

STREET GRADING.

A fair proportion of street grading by contract was done during the year, and at very reasonable prices. The number

of contracts for this work was seven, and the prices ranged from twelve and a quarter cents to twenty-two cents per cubic yard; the average cost per cubic yard for the year being a trifle less than sixteen cents.

WALKS AND CURBS.

During the working season, a portion of the department was kept busy in giving the necessary lines and grades for curbing and sidewalk work. The total length of curb lines and grades given during the year amounts to twelve and one-fifth miles of straight work, in addition to the curves now given for all corners.

COBBLE GUTTERS.

Under orders from the Court of Common Council, 70,893 square feet of cobbled gutters have been laid on fourteen different streets. The total length of the work completed during the year, is 14,271 feet, or nearly two and three-quarter miles, and varying in width from four to six feet.

The ownership of the lands adjoining has been ascertained in all cases, and the proper estimate or proportion for each party to pay has been measured and computed.

MERE STONES.

For defining street lines, fifty-three new mere stones were set, and forty-seven old ones reset during the year.

SURVEYS AND MAPS.

Special maps and surveys have been made in all cases where required by the Board of Road Commissioners,—the Board of Compensation, for the opening and widening of streets, etc.,—the Board of Compensation for the assessment of sewers and pavements,—the Committees on Building Lines, numbering streets, sewers, streets; etc.

The work upon the surveys and maps is short, compared with the time which it is necessary to spend in ascertaining the correct ownership of the lands adjoining the streets under consideration, or affected by a proposed improvement.

An immense amount of work has been required, in this particular, during the year, by the two Boards of Compensation, and the Committee on Building Lines, a fact that is known or realized by very few outside the department.

NOTIFICATIONS.

Preparing and serving notices as required by the Board of Road Commissioners, the Board of Compensation, and for other purposes, consumes a large amount of time during the year. The amount of this work for the year is as follows :

Number of notices prepared and served for hearings before Board of Road Commissioners, ...	137
Number of notices prepared for hearings before Board of Compensation, for assessing Sewers and Pavements, ...	55
Number of notices prepared and served for making connections with sewers, gas, and water mains, ...	226
Number of notices prepared and served for the numbering of streets, ...	1,259
Number of notices prepared and served for miscellaneous purposes, ...	33
Total, ...	1,710

INTERNATIONAL EXHIBITION.

In my report for the year 1876, I referred to the fact that a small book of plans, etc., of some portions of our public work had been placed on exhibition at the Centennial Exhibition at Philadelphia, and that the exhibit had received an award of a diploma and medal. Since the date of my last report, the awards have been received, and also the judge's report, from which I make the following extract :

"It is a neat and systematic manner of keeping the plans, records, and information concerning the public work of the city. The execution is admirable throughout."

TABLES.

Accompanying the reports of the Street Department, and as a part of them, will be found a series of tables or statements, showing in detail much interesting and valuable information concerning the different branches of public work.

CONCLUSION.

The City Engineer Department for the year 1877 has consisted of the City Surveyor and four assistants. During the busy season, we were unable to keep up with the work as ordered, and some unavoidable delays were caused. On this account, much of the office work was neglected, but it is expected that we can be able to complete the maps and records of the year's operations, if the present force is retained, before work commences in the coming spring.

Respectfully,

CHARLES E. FOWLER,
City Surveyor.

CITY INSPECTOR'S DEPARTMENT.



CITY INSPECTOR.
PATRICK WARD.

Term expires Nov. 9, 1879. Residence, junc. Howard and Kimberly Aves.



CLERK.
FRED H. WALDRON.



Office, Room 9, City Hall.

R E P O R T
OF THE
CITY INSPECTOR.

To the Honorable Board of Road Commissioners :

I have the honor to submit herewith a brief report for the eleven months ending November 30, 1877.

There have been but sixteen new crosswalks laid during the past season. All the crosswalks on Congress avenue and Davenport avenue, and the streets crossing these avenues between Vernon street and West river have been relaid, necessitated by the regrading of these avenues. This work involved the largest amount of the cost of crosswalks for the year.

Cobble gutters have been laid on twelve streets or avenues, as will be seen by the accompanying tables.

This work will save quite an expense to the city each year, as the cobbling has been done where at each rain storm the gutters and roadway were badly washed out.

There are still quite a number of streets where the gutters could be cobbled with advantage to the city and adjoining proprietors. This is especially the case upon the roadways leading to and crossing West river, where the soil is light and sandy.

At Lamberton street, Washington street, Columbus street, and Davenport avenue, near West river, I have had chutes constructed to take the surplus water from the roadways. Considerable trouble has been experienced at these points to maintain the roadway. This will in a measure obviate the difficulty.

There has been but a small amount of turnpiking streets done during the past season, the entire cost of which has been \$1,579.05. The work is shown in detail in statement No. 11.

Sidewalks and curbs have been completed in thirty-eight streets. In addition thereto there have been repairs, and relays of walks completed by the property-holders upon request of the Board, without orders from the Common Council. The entire length of this work is $8\frac{53}{100}$ miles.

The abutments to the Grand street bridge over Mill river have been rebuilt, and the bridge replanked.

The planking on the west causeway to the Chapel street bridge has been taken up. The whole has been filled in with earth; the sidewalks have been relaid, and curbs reset.

Lewis bridge and the Quinnipiac bridge at Grand street have received some repairs.

I have had on an average thirty men in my employ daily during the past year. I have endeavored to change them each week, where I could do so without serious detriment to the city. There are some men who work at cleaning sewers, catch basins, etc., that it would be inexpedient to change.

The books show over 600 different names of men who have been under my charge during the past year.

Respectfully submitted,

PATRICK WARD,

City Inspector.

STREET DEPARTMENT—STATEMENT NO. 1.
WORK ON SEWERS IN 1877.

STREET.	CONTRACTOR.	Length.	Size and Material.	Cost of Sewer.	Cost of Manholes, Basins, etc.	Total Cost
Chapel street.... Corner of Temple street.....	Matthew Kehoe,...	63.1	30 in. B.	\$94.65	\$	\$
Crown street,..... " Temple street.....	Matthew Kehoe,...	29.2	24 in. B.	55.48		
Franklin street... Water to Chapel street.....	Matthew Kehoe,...	1,030.5	30 in. B. 8 in. I.	2,164.05		
Highland street... Whitney avenue to Autumn street..	Laurence O'Brien,...	322.4	24 in. B.	560.98	} 2,016.79	} 3,102.05
Highland street... Autumn to St. Ronan street,.....	Laurence O'Brien,...	436.9	15 in. C. P.	524.28		
Temple street.... George to Chapel street.....	Matthew Kehoe,....	890.7	30 in. B.	1,336.05		
Wallace street... Corner of St. John street.....	City,.....	22.	12 in. C. P.			
Whitney avenue.. Canner to Cold Spring street.....	Laurence O'Brien,...	573.2	30 in. B.	1,347.02		
Whitney avenue... Cold Spring to Highland street....	Laurence O'Brien,...	749.8	24 in. B.	1,304.65	} 1,315.56	} 4,056.15
Whitney avenue... Corner of Highland street.....	Laurence O'Brien,...	74.1	15 in. C. P.	88.92		

STREET DEPARTMENT—STATEMENT No. 2.
SEWER CONTRACTS COMPLETED IN 1877.

STREET.	Size and Material.	Average Cut.	Length.	Nature of Excavation.	Contract price per foot.
Chapel street.....Corner of Temple street.....	30 in. B.	9.6	63.1	Sand, ...	\$1.50
Franklin street.....Water to Chapel street.....	30 in. B. 8 in. I.	10.	1,030.5	Sand, Loam, and Water, ..	2.12
Temple street.....George to Chapel street.....	30 in. B.	11.2	890.7	Sand, ...	1.50
Whitney avenue....Canner to Cold Spring street	30 in. B.	10.	573.2	Sand and Gravel, ...	2.35
Crown street.....Corner of Temple street.....	24 in. B.	14.	29.2	Sand, ...	1.90
Highland street Whitney avenue to Autumn street ..	24 in. B.	9.9	322.4	Sand, ...	1.74
Whitney avenue....Cold Spring to Highland street	24 in. B.	9.	749.8	Sand and Gravel, ...	1.74
Highland street.....Autumn to St. Ronan street....	15 in. C. P.	8.6	436.9	Rock and Sand, ...	1.20
Whitney avenue....Corner of Highland street.....	15 in. C. P.	8.6	74.1	Sand and Gravel, ...	1.20
Wallace street.....Corner of St. John street.....	12 in. C. P.	12.	22.	Sand and Gravel, ...	Built by City.

STREET DEPARTMENT—STATEMENT No. 3.

COMPARISON OF BIDS ACCORDING TO ESTIMATES OF QUANTITIES.

STREET.	BIDDERS.	Price.
Whitney avenue, and Highland street,)	{ Matthew Kehoe,.....	\$10,797.00
	{ Michael Fitzpatrick,.....	9,860.00
	{ Wm. S. Fowler,.....	9,780.00
	{ Devlin & McKien,.....	9,510.00
	{ Wm. Grandfield,.....	6,268.00
	{ Laurence O'Brien,*.....	5,816.00
Franklin street,.....	{ Michael Brennan,.....	3,523.50
	{ Davis & Fowler,.....	3,010.00
	{ Laurence O'Brien,.....	2,679.00
	{ Wm. Grandfield,.....	2,444.50
	{ Matthew Kehoe,*.....	2,323.10
Temple street,.....	{ Michael Brennan,.....	3,430.00
	{ Davis & Fowler,.....	2,802.50
	{ Laurence O'Brien,.....	2,587.00
	{ Wm. Grandfield,.....	2,223.50
	{ Matthew Kehoe,*.....	1,924.00

Total difference between highest and lowest, \$7,687.40.

* Awarded the contract.

STREET DEPARTMENT—STATEMENT No. 4.

SEWERS ABANDONED IN 1877.

STREET.	Size and Material.	Length.
Chapel street.....Corner of Temple street,.....	24 in. Cement Pipe,.....	20. feet.
Crown street.....Corner of Temple street,.....	18 in. Cement Pipe,.....	37.5 "
Franklin street.....Water to Chapel street,.....	24 in Cement Pipe,.....	1,030. "
Temple street.....Center to Chapel street,.....	18 in. Cement Pipe,.....	251. "
Total,.....		1,338.5 feet.

STREET DEPARTMENT—STATEMENT No. 5

NEW PAVEMENTS DURING 1877.

Street.	Location.	Contractor.	Kind of Pavement.	Length in feet.	Number of Square Yards.	Cost per Square Yard.	Total Cost.
Olive,.....	Grand st. to R. R. Bridge,	P. Dowling,.....	Telford,....	653.7	2,250.	\$1.04	\$2,340.00
Orange,.....	Crown to George street, ..	R. Stevens,.....	Telford,....	339.7	812.76	1.21	983.44
St. John,.....	Olive to East street,.....	R. Connor,.....	Telford,....	2,506.6	8,643.86	1.03	8,903.17

STREET DEPARTMENT—STATEMENT No. 6.

COMPARISON OF BIDS ON TELFORD PAVEMENTS IN 1877.

STREET.	BIDDER.	Price per Square Yard
Olive street.....Grand to R. R. Bridge,.....	D. A. Blakeslee,.....	\$1.03½
Olive street.....Grand to R. R. Bridge,.....	Robert Stevens,.....	.94
Olive street.....Grand to R. R. Bridge,.....	Patrick Dowling,*.....	.87
Orange street.....Crown to George street,.....	D. A. Blakeslee,.....	1.04
Orange street.....Crown to George street,.....	Robert Stevens,*.....	.97
St. John street.....Olive to East street,.....	Robert Stevens,.....	1.09
St. John street.....Olive to East street,.....	Patrick Dowling,.....	.98
St. John street.....Olive to East street,.....	D. A. Blakeslee,.....	.97½
St. John street.....Olive to East street,.....	Richard Connor,*.....	.89

Total difference between the amounts of highest and lowest bids on Pavements, \$2,138.61.

* Awarded the contract.

STREET DEPARTMENT—STATEMENT No. 7.

SHOWING PAVEMENTS REPAIRED DURING 1877.

LOCATION.	Kind of Pavement.	Work Done.	Cost.
Chapel street,.....	Belgian,.....	Repairs,.....	\$99.25
Chapel street,.....	Wood,.....	Repairs,.....	57.10
East street,.....	Belgian,.....	Repairs,.....	257.00
Grand street,.....	Belgian,.....	Repairs,.....	37.00

STREET DEPARTMENT—STATEMENT No. 8.

SHOWING STREETS GRADED DURING 1877.

STREET.	Between what points.	Contractor.	Length in feet.	Number of Cubic Yards.	Cost per Cubic Yd.	Total Cost.
Carlisle street,.....	Water to Meadow street,.....	City,.....	260	.....	.....	\$27.40
Chatham street,.....	Downing to Front street,.....	City,.....	465	.....	.....	62.50
Commerce street,...	Factory to Water street,.....	City,.....	1,780	.....	.....	1,692.45
Columbus street,...	Near West Bridge,.....	City,.....	.....	.....	.....	56.86
Congress avenue,...	West to Baldwin street,.....	E. Dickerman, Jr.,...	1,610	2,895	.14 $\frac{1}{2}$	419.77
Congress avenue,...	West to Baldwin street,...	J. Rourke,.....	1,450	2,830	.13 $\frac{1}{2}$	382.05
Congress avenue,...	West to Baldwin street,.....	T. Colwell,.....	.....	430.5	.18	77.49
Davenport avenue,...	Vernon street westerly,.....	J. Roach,.....	2,610	3,296	.12 $\frac{1}{2}$	403.76
Davenport avenue,...	Vernon street westerly,.....	J. N. Maloney,.....	680	2,441	.13 $\frac{1}{2}$	384.46
Davenport avenue,...	Vernon street westerly,.....	City,.....	.....	.....	.....	367.98
Haven street,.....	Clay to Market street,.....	C. W. Blakeslee,...	.....	455	.22	100.10
Kimberley avenue,...	Lamberton street to West River,.....	City,.....	.....	.....	.....	71.68
Low lands,.....	South of Water and West of Meadow st.,...	D. A. Blakeslee,...	1,890	3,954	.21 $\frac{1}{2}$	785.61
Morris street,.....	Lamberton to Washington street,.....	City,.....	860	.....	.....	672.69
River street,.....	Ferry to Pearl street,.....	City,.....	220	.....	.....	150.00
Thorn street,.....	Eddy to West street,.....	City,.....	600	.....	.....	156.65
						156.25

STREET DEPARTMENT—STATEMENT No. 9.

COMPARISON OF BIDS FOR STREET GRADING IN 1877.

99

LOCALITY.	CONTRACTOR.	Price per cu. Yard.
Congress avenue,..... Baldwin street to Downes street,.....	C. W. Blakeslee,.....	.20
Congress avenue,..... Baldwin street to Downes street,.....	Robert Stevens,.....	.19
Congress avenue,..... Baldwin street to Downes street,.....	Enos Dickerman, Jr.,*	.14½
Congress avenue,..... Bond street to West River,.....	Robert Stevens,.....	.30
Congress avenue,..... Bond street to West River,.....	D. A. Blakeslee,.....	.21½
Congress avenue,..... Bond street to West River,.....	J. Kivlehan,.....	.17
Congress avenue,..... Bond street to West River,.....	J. Rourke,*,.....	.13½
Davenport avenue,..... Vernon street to West street,.....	D. A. Blakeslee,.....	.23
Davenport avenue,..... Vernon street to West street,.....	Patrick Leonard,.....	.18½
Davenport avenue,..... Vernon street to West street,.....	Moses Nolan,.....	.13¾
Davenport avenue,..... Vernon street to West street,.....	John Roach,*,.....	.12½
Davenport avenue,..... West street to West Bridge,.....	D. A. Blakeslee,.....	.18½
Davenport avenue,..... West street to West Bridge,.....	John Roach,.....	.17½
Davenport avenue,..... West street to West Bridge,.....	Robert Stevens,.....	.17 1/10
Davenport avenue,..... West street to West Bridge,.....	Jas. W. Maloney,*,.....	.15¾
Kimberley avenue,..... Lamberton street to West River,.....	Robert Stevens,.....	.29¾
Kimberley avenue,..... Lamberton street to West River,.....	D. A. Blakeslee,*,.....	.21 1/2

Total difference between highest and lowest bids, \$1,349.07.

* Awarded the Contract.

STREET DEPARTMENT—STATEMENT No. 10.
SHOWING MISCELLANEOUS WORK ON STREETS, &C.

STREET.	WORK DONE.	Cost.
Chatham, ...	Shelling Front to Downing street, ...	\$51.50
Chatham, ...	Shelling and grading Slip, ...	17.60
Pine, ...	Shelling and grading Slip, ...	17.20
State, ...	Hardening Neck Bridge northerly, ...	300.00
Temple, ...	Hardening Elm to Chapel, ...	125.00

STREET DEPARTMENT—STATEMENT No. 11.

SHOWING STREETS TURNPIKED DURING 1877.

Street.	Amount.
Broad, ...	\$40.00
Baldwin, ...	30.00
Carlisle, ...	15.00
Columbus, ...	90.00
Commerce, ...	155.00
Elliot, ...	17.50
Goffe, ...	61.25
Gilbert avenue, ...	32.50
Greenwich avenue, ...	145.00
Hallock, ...	92.50
Hill, ...	92.50
Hudson, ...	120.00
Lamberton, ...	15.00
Morris, ...	30.00
Norton, ...	80.00
Oak, ...	54.00
Prospect, ...	57.50
Washington, ...	240.00
Water (West), ...	105.00

STREET DEPARTMENT—STATEMENT No. 12.

SHOWING WORK ON BRIDGES DURING 1877.

LOCATION.	Work Done.	Cost.
Barnesville,.....	Repairing Abutment and Replanking,.....	\$493.66
Chapel street,.....	Repairing Walk,.....	26.79
West Bridge,.....	Fence upon Retaining Walls,.....	179.72
West Bridge,.....	Retaining Walls,.....	358.63
West Bridge,.....	Catch Basins,.....	50.76
West Bridge,.....	Filling adjoining Retaining Walls,.....	140.97—
Lewis,.....	Repairs,.....	\$730.08
Quinnipiac to Grand street,.....	Repairs and Replanking,.....	62.54
Quinnipiac new,.....	Retaining Walls,.....	168.17
Quinnipiac new,.....	Filling,.....	2,280.38
Quinnipiac new,.....	Shells for hardening,.....	872.73
Quinnipiac new,.....	Repairs Abutment and Center Pier,.....	415.50
Quinnipiac new,.....	Fence on Retaining Walls,.....	594.03
Quinnipiac new,.....	Bridge Tender's House,.....	850.85
Quinnipiac new,.....	Services of Bridge Tenders,.....	100.00
		379.14—\$5,492.63

STREET DEPARTMENT—STATEMENT No. 13.

SHOWING COBBLE GUTTERS DURING 1877.

STREET.	Between what points.	Side.	Cost.
Carlisle street,.....	Water and Liberty streets,.....	Both,.....	\$455.78
Chatham street,.....	Downing to Front street,.....	Both,.....	256.80
Clinton avenue,.....	Grand street 300 feet northerly, ..	East,.....	36.79
Congress avenue,.....	Bond street westerly,.....	Both,.....	1,180.49
College street,.....	Chapel to Crown street,.....	East,.....	128.24
Davenport avenue,.....	West street westerly,.....	Both,.....	1,419.11
Grand street,.....	Clinton avenue easterly,.....	South,.....	45.38
Lafayette street,.....	Prince to Silver street,.....	Both,.....	203.62
Norton street,.....	Chapel street to Derby avenue,.....	East,.....	132.30
Oak street,.....	Tyler street westerly,.....	Both,.....	312.04
Prospect street,.....	L. B. Morris' property northerly,...	West,.....	461.68
Saltonstall avenue,.....	Mill street westerly,.....	North,.....	59.20
Spruce street,.....	Oak to George street,.....	East,.....	111.98
Winthrop avenue,.....	Sylvan avenue southerly to the Catch Basin,.....	East,.....	102.90

STREET DEPARTMENT—STATEMENT No. 14.

SHOWING NEW CROSSWALKS LAID DURING 1877.

STREET.	Location.	Side.
Arch street,.....	Across Congress avenue,.....	East.
Asylum street,....	“ Sylvan avenue,.....	East.
Baldwin street,....	“ Congress avenue,.....	East.
Beech street, ...	“ Wallace street,.....	South.
Broad street, ...	“ Rose Court,.....	South.
Carlisle street, ...	“ Liberty street,.....	North.
Chapel street,....	“ Ellsworth avenue,.....	North.
Clay street,.....	“ Jackson street,.....	North.
Elliot Lane,.....	“ East street,.....	South.
Humphrey street,..	“ State street,.....	North.
Lloyd street,....	“ Wolcott street,.....	South.
Leonard street,...	“ Summer street,.....	East.
Mansfield street,..	“ Sachem street,.....	West.
Norton street,....	“ Chapel street,.....	West.
Pine street,.....	“ Clinton avenue,.....	South.
Prospect street,...	Between Sachem and Division streets....	

REPORTS
OF THE
STREET DEPARTMENT,
1878.

BOARD OF ROAD COMMISSIONERS.

Chairman.

PHILO CHATFIELD.

Term expires Feb. 1, 1880.

Residence, 10 Lyon st.

FRANCIS DONNELLY.

Term expires Feb. 1, 1880.

Residence, 101 Middletown ave.

WILLIS G. JUDSON.

Term expires Feb. 1, 1879.

Residence, 95 Chapel st.

ISAAC ANDERSON.

Term expires Feb. 1, 1881.

Residence, 113 Chapel st.

JONATHAN W. POND.

Term expires Feb. 1, 1881.

Residence, 99 St. John st.

Clerk.

FRED. H. WALDRON.

Term expires Nov. 9, 1879.

Residence, 105 Howe st.

OFFICE, ROOM NO. 9, CITY HALL,

Regular meetings every Thursday evening.

REPORT
OF THE
BOARD OF
ROAD COMMISSIONERS.

To the Honorable Court of Common Council:

Herewith please find the annual report of the Board of Road Commissioners for the year ending Nov. 30, 1878.

Your honorable body has transmitted to this Board for execution sixty orders during the year, as follows: Twenty-five for side-walks and curbs; nine for grading streets; four for sewers; one for paving streets; four for cobble-gutters; seventeen miscellaneous.

Six layouts for opening, widening, or extending streets have been adopted by this Board, and the same transmitted to your honorable body for approval, as follows:

For Canal street and extension, from Munson street to Prospect street.

For Fawn street, from Middletown avenue to the Air Line R. R. track.

For widening and straightening Morris street.

For widening and straightening West street, from Davenport avenue to Washington street.

For extending Fillmore street to Peck street.

For extending Mulberry street to Greenwood street.

New sewers have been constructed as follows:

In Franklin street, from the Railroad bridge to William street, and thence to Hamilton street, through a right of way from Franklin to Hamilton street, nearly opposite William street.

In George street, from Dwight to Day street.

In Martin street, from Dwight to Garden street.

In Temple street, from Chapel to Elm street, for the purpose of draining the old Green.

In Cedar street, from Prince to Gilbert street.

In Greene street, from Hughes' place to Academy street.

This Board also received an order from your honorable body for constructing a sewer in Oak street from York to Spruce street, but before the work was commenced therein, notice was received by this Board that the order was rescinded.

The length of these new sewers, together with the curves which have been constructed at street corners is 0.676 miles, making the total length of the sewers at the present time a fraction over $33\frac{1}{2}$ miles.

The only new pavements constructed during the year were on Temple street, from Chapel street to Crown street. On East street from Greene street to St. John street, and on Chapel street from Church street to York street.

The Nicholson (wood) pavement on Chapel street, which was constructed in the fall of 1869, having become dangerous, a new pavement was ordered by your honorable body. That portion from Church to Temple streets was constructed of Belgian blocks, the contract price of which was $\$1\frac{23}{100}$ per square yard. That portion from Temple to York street being Telford—except between and 14 inches each side of the Horse Railroad tracks, and the gutters being of Belgian blocks, the contract price of which was $\$1\frac{06}{100}$ per square yard. The total cost of this pavement was \$10,500.25. The wood pavements on Crown and Union streets are very much worn, and must soon be replaced with something more durable.

The total length of paved streets in the city at the present time is 13 miles. Pavements have been repaired on fourteen streets, a detailed report of which will be found by reference to statement No. 4.

A new bridge in place of the old structure known as Lewis bridge has been contracted for, and will be completed early in the spring; the abutments are now completed and ready for the superstructure. Barnesville bridge at Grand

street, Chapel street bridge over Mill-river, and Quinnipiac bridge at Grand street have been repaired and strengthened.

This Board have orders for constructing bridges in conjunction with the N. Y., N. H. & H. R. R. Company over their tracks at Lamberton and Dewitt streets.

These bridges cannot be constructed until the Railroad Company lower their tracks at these points, which they have agreed to do at an early date; if so, these bridges will be constructed during the coming year.

This Board recommended to your honorable body the passage of an order for the extension of the retaining or sea-wall to the approach of the new bridge over West river at Congress avenue. This is deemed necessary to protect the roadway, as at every heavy rain storm the walks, curb, and fences are washed away, making the expense for repairs considerable.

In addition to the general work on the public parks, a new iron fence has been constructed around Jocelyn Square at a cost of \$2,440.00, and a new concrete walk has been constructed on the old Green, from the corner of Chapel and College streets to a point near the North church on Temple street, being about 800 feet in length, costing \$314.26. Other works on parks is shown in detail by statement No. 11.

The amount expended for grading streets was larger than the preceding year. The appropriation for this class of work made at the commencement of the year was \$3,000.00. In consequence of the large number of orders passed by your honorable body for grading, it was necessary to ask for a transfer of \$4,000.00 from general repairs and bridges to grading streets. Fawn street was graded by days' work, instead of by contract. This Board advertised for proposals for grading this street, which were opened on the evening of May 30, 1878, the lowest bid being that of John Nolan at .09 $\frac{3}{4}$ cts. per cubic yard.

Before the contract was awarded, a committee of working-men stated that they desired a stay of proceedings until they could petition your honorable body to have the work done by

the day, instead of by contract. They stated that they could do the work as cheap, or cheaper, than by contract, and thereby afford work for the unemployed laboring class. This Board rejected the bids for doing this work by contract, and gave it to the workingmen's committee, with power to hire their own men and do the work. This work was completed at a cost of \$322.25. There were 2,282 cubic yards of earth moved, costing $14\frac{1}{4}$ cts. per cubic yard, or nearly 50 per cent. more than the contract price.

There were 7,054.35 cubic yards of stone crushed at the crushing works during the past year, being 3,825 cubic yards more than were crushed the preceding year. The amount of bills approved for the stone-crusher amounted to \$5,970.94. Bills to the amount of \$550.00 were not approved, owing to the appropriation having been exhausted. This amount must be paid from the appropriation of 1879.

This Board awarded twenty-two contracts for paving streets, constructing sewers, furnishing cobbles, grading streets, etc. In each case the contract was awarded to the lowest bidder in public meeting.

Thirty-four orders for walks and curbs have been completed during the year in accordance with orders from your honorable body, the length of which is seven and nine-tenths miles.

In addition thereto this Board have had, through the sidewalk inspector, 2,403 feet of brick and 518 feet of flag walk relaid; 57 corners were pieced out to meet the crosswalks, and 160 repairs made around water boxes, coal vaults, etc.

On the 24th day of last February, the City Inspector, Mr. Patrick Ward, died suddenly at his home. Mr. Ward was first elected City Inspector August 18, 1870, and was re-elected September 2, 1873, and again re-elected November 9, 1876, and held the position up to the time of his death. Mr. Ward was an excellent officer, and labored hard for the city's good.

The following resolutions were unanimously adopted by this Board February 25, 1878, at a meeting called for that purpose:

WHEREAS, This Board have received the sad intelligence of the death of Patrick Ward, late City Inspector, therefore

Resolved, That, as a just tribute to the memory of the departed, we should and do hereby recognize his past services and worth as a public officer, who has served the city for nearly eight years in this department in one of its chief and most responsible positions.

Resolved, That the public have sustained a great loss, in the removal from the stage of action, of one who was zealous in the discharge of his duties and faithful to the trusts reposed in him.

Resolved, That we recognize the heavy hand of affliction in the death of the late City Inspector, and deeply sympathise with the family in the dispensation with which it has pleased Almighty God to visit them.

Resolved, That this Board will attend the funeral of the deceased in a body, and request the ex-members of the Board to join with them on the occasion.

Resolved, That the foregoing resolutions be entered in full upon the minutes of this Board, and a copy forwarded to the family of the deceased.

This Board held seventy evening sessions at their office, and twenty-eight meetings outside looking at and advising about work in process of completion, etc., making nearly one hundred meetings held by the Board during the past year.

Respectfully submitted in behalf of the Board,

FRED. H. WALDRON, *Clerk*.

REPORT
OF THE
CITY SURVEYOR,
1878.

CITY ENGINEER DEPARTMENT.

1878.



OFFICE: Room No. 9, City Hall.

DRAUGHTING ROOM: Room No. 18, City Hall.

CHARLES E. FOWLER, City Surveyor.

ALBERT B. HILL, 1st Assistant Engineer.

CHARLES A. FERRY, Assistant Engineer.

In charge of Sewerage work.

CASSIUS W. KELLY, Assistant Engineer.

In charge of Street work.

F. FLOYD WELD, Assistant Engineer.

In charge of Surveys, Maps, and Records.

REPORT

OF THE

CITY SURVEYOR.



To the Honorable Board of Road Commissioners :

I have the honor to submit the following report of the work of the City Engineer Department for the year 1878 :

SEWERAGE.

The work in the sewerage department comprises the construction of sewers in twelve different streets, and one through the right of way from Franklin street to Hamilton street.

The sewer through the right of way referred to provides an outlet for the sewers designed to be constructed in William street and the streets between William street and the railroad tracks. It was necessary in the construction of this sewer to pass beneath two dwelling houses, but the work was performed carefully, and no injury resulted to the property.

During the year a complete system of sewerage has been prepared for the Fair Haven district, and considerable progress made in perfecting the system for the northern section of the city. The details of this work will be given in a subsequent report.

SEWERS BUILT.

The entire length of sewers in actual use at the commencement of the year 1878 was 32.889 miles. By construction during the year there was added :

501.5 feet of sewer, 24 inches in diameter.						
1566.7	"	"	"	15	"	"
1500.1	"	"	"	12	"	"

A total length of 3568.3 feet, or 0.676 miles, making the total length of sewers in actual use at the close of the year to be 33.565 miles.

CLEANING AND REPAIRS.

When not otherwise engaged, the sewer inspectors are kept employed making necessary repairs and changes in our sewers, basins, culverts, etc., and in cleaning and flushing those sewers that need such attention.

STREETS.

The paving of streets, sidewalks, and gutters, and contract grading require the constant attention of this department during the greater part of the year. Much of this work being done under contract, giving the necessary lines, grades, etc., and making the monthly measurements and estimates, keep a portion of the department fully employed during the working season ; in fact, at times, it has been difficult to keep up with the work ordered, but in all cases it has been completed with as little delay as possible.

STREET PAVEMENTS.

At the commencement of the year 1878, the city had in use 12.769 miles of paved streets, 9.193 miles of which was of Telford pavement, and the balance, 3.576 miles of Belgian and other kinds. During the year, there has been 0.167 miles of streets paved with Telford pavement, and the Nicholson pavement on Chapel street has been taken up, and replaced with Belgian pavement from Church street to Temple street, and with Telford pavement from Temple street to York street. The total length of paved streets now is 12.936 miles, and is divided among the different kinds as follows :

Telford pavement,	.	.	.	.	9.626 miles.
Belgian "	.	.	.	.	2.300 "
Wood, "	.	.	.	.	0.219 "
Concrete, "	.	.	.	.	0.308 "
McAdam, "	.	.	.	.	0.322 "
Cobble, "	.	.	.	.	0.161 "
Total,	.	.	.	.	12.936 "

STREET GRADING.

The whole or parts of twenty streets were graded during the year, eight being done under contract, and the rest by the City Inspector or day work.

WALKS AND CURBS.

For laying or re-laying sidewalk pavement, setting or re-setting curbs, and grading of walks, the department has given during the year five and three-eighths miles of required lines and grades, not including the curves now given for turning the corners of all intersecting streets.

COBBLE GUTTERS.

The total length of cobbled gutters laid during the year amounts to 10,335 feet or very nearly two miles, covering an area of 51,221 square feet.

BRIDGES.

The care and repairs of the bridges already constructed belonging to the city being under the supervision of the City Inspector, the Surveyor's Department has only to do with new constructions. There has been but one such during the year, viz.: Lewis bridge, over the Quinnipiac river at Middletown avenue. The old wooden bridge was about 143 feet long, between abutments, with about 15 feet roadway. It rested on a timber crib at the center, and two intermediate pile piers each side of the crib, and was in a very dilapidated condition throughout. To its untrustworthiness your attention was called in previous reports, and more than two years ago the Court of Common Council ordered a new bridge, but owing to the lack of a sufficient appropriation, and the backwardness of the town of East Haven in coöperating with the city, work was not commenced until November, 1878. The substructure is now completed, and consists of two abutments with their necessary wing walls, all built under one contract, but each corporation meeting the expense of the work on its own shore.

The abutments are cut stone front, and corners with rubble backing, supported on a pile and timber foundation. The wing walls are rubble masonry with cut stone coping, and are supported the greater part of their length on a pile and timber foundation. For a portion of the city wing walls the foundation was deemed sufficient without piling.

The cost of the city abutment and foundation	
complete was, ...	\$623.00
Of the wing walls and foundations, ...	1,089.45
Total, ...	<u>\$1,712.45</u>

The superstructure is to be a single span, 150 feet from center to center of end supports, with 18 feet clear roadway, and is to be iron throughout, excepting joists, planking, and wheel-guards. Specifications were prepared, and an abstract sent to the various bridge companies, prescribing the length and width of the bridge, the loads for which it should be calculated, the maximum unit strains allowed, the quality of material and workmanship required, etc., in order that all parties should bid on precisely the same basis. Plans were also prepared on the same basis in this office, from designs by Assistant Engineer A. B. Hill, and it is but just to the department to say that the lowest bids conforming to the required standard were on the "Engineer's Plan," and the plan adopted was the Engineer's plan for a truss bridge. The bridge is calculated to carry, with a factor of safety of five, besides its own weight, a moving load of 80 lbs. per square foot of roadway, or 108 tons uniformly distributed; or a concentrated load of 15,000 lbs. on two wheels six feet apart, placed anywhere on the roadway. It will contain no waste metal, but each member will be just as strong proportionally as every other member, and the iron is made in such shapes as to give a maximum of strength with a minimum of material.

No cast iron is to be used in any principal member, and only in the portal brackets, end-post shoes, and a few washers. The superstructure is to be built by the New York Bridge Co., of New York city, for the sum of \$3,695.00, the city paying seven-twelfths, and the town of East Haven five-twelfths of the amount.

The bridge is to be completed and opened to public travel early in the spring.

Before leaving the subject of bridges, I desire to call attention again to the dangerous condition of the old bridge over West River at the Derby avenue crossing. Of all the bridges that the city is interested in, this is now in the poorest condition, and proper steps for replacing it with a better structure should be taken at an early date.

MERE STONES.

Whenever other duties will admit, the work of defining the lines of the streets of the city is still carried on, and the points permanently established by the setting of mere stones.

The corners were located for a number of streets, but on account of limited time, but seventeen new mere stones were set and fifteen old ones reset.

The resetting of the old stones was rendered necessary by the newly established lines and grades of the streets.

SURVEYS AND MAPS.

Surveys have been made, and maps and profiles prepared for all proposed improvements before the Board during the year. In addition to the work required by the Board, this department has furnished the maps and other information required by the Board of Compensation for opening and widening streets, the Board of Compensation for the Assessment of Sewers and Pavements, the Committee on Building Lines, the Committee on Numbering Streets, etc. As heretofore, this department has been obliged to give a large amount of time to ascertaining, from the records, the correct ownership of lands, for the purpose of notification, assessment, etc.

NOTIFICATIONS.

Number of notices prepared and served for hearings before the Board of Road Commissioners, ...	158
Number of notices prepared and served for making connections with sewer, water, and gas mains, ...	60
Number of notices prepared and served for the numbering of streets, ...	248
Number of notices prepared and served for miscellaneous purposes, ...	44
Total, ...	510

TABLES.

Accompanying the reports of the Street Department will be found the usual statements, showing the details of the principal portions of the year's work and other information of interest.

CONCLUSION.

In conclusion I have to report that the force employed in the City Engineer Department during the year, by strict attention to duty, have been enabled to complete the outdoor work ordered, without unreasonable delay.

The office work is considerably in arrears, but much of this will be completed before the spring work commences, as it will now receive all the attention that can be given to it.

Respectfully,

CHARLES E. FOWLER,

City Surveyor.

REPORT
OF THE
CITY INSPECTOR.
1878.

CITY INSPECTOR'S DEPARTMENT.



CITY INSPECTOR.
PATRICK DOYLE.

Term expires Nov. 9, 1879.

Residence, 210 Ferry street.



CLERK.
FRED H. WALDRON.

Term expires Nov. 9, 1879.

Residence, 105 Howe street.



Office, Room 9, City Hall.

REPORT

OF THE

CITY INSPECTOR.

To the Honorable Board of Road Commissioners :

I have the honor to submit herewith a brief report of my official acts since assuming the position of City Inspector.

Upon assuming the duties of City Inspector in April last, I found considerable work in process of completion, all of which I carried out according to the original design. Since which time I have carried out all work placed in my hands emanating from your honorable board.

All work placed in my hands was completed before cold weather except the grading of Canal street extension, which I was obliged to postpone until the retaining walls can be completed by the N. H. & N. R. R. Co. The total cost of this work up to the time of postponement is \$1,161.42.

The whole or portions of 22 streets have been turnpiked.

Barnesville bridge, crossing Mill river at Grand street, has been replanked, and new timbers have been put in. Quinnipiac bridge, over Quinnipiac river at Grand street, has been replanked and retimbered, at a cost of \$1,375.99.

I have had some minor repairs done on the other bridges in the city.

Cobble-gutters have been put down or repaired on 10 different streets.

I have had 32 new cross-walks laid in accordance with orders from your honorable board.

Details of the work will be seen by the reference to the

statements which have been prepared, and accompany these reports. In closing, I wish to return my thanks to your honorable board for the courteous manner in which I have been assisted in my labors, and also to the City Surveyor, Charles E. Fowler, and the Clerk, Fred. H. Waldron, for the many kindnesses shown, and valuable assistance rendered me while in the discharge of my duties as City Inspector. As I was elected to this position in the busy season of the year, with considerable work commenced, the assistance rendered by them at that time, enabled me to successfully cope with the work in hand.

Respectfully submitted,

PATRICK DOYLE,

City Inspector.

STREET DEPARTMENT—STATEMENT No. 1.

WORK ON SEWERS IN 1878.

STREET.	Contractor.	Length.	Size and Material.	Cost of Sewer.	Cost of Manholes, &c.	Total Cost.
Cedar street,..... Prince to Gilbert,	Laurence O'Brien,	357.5	15 in. C. P.	\$264.55	\$655.35	\$1,044.64
Cedar street,..... "	Laurence O'Brien,	231.0	12 in. C. P.	124.74		
Elliott's Lane,..... Corner of East street,	City,	28.0	15 in. C. P.	53.00	575.62	1,032.74
Franklin street,..... William street,	Wm. Granfield,	26.5	15 in. C. P.	404.12		
Franklin street,..... William street to Railroad,	Wm. Granfield,	278.7	12 in. C. P.	345.62	602.54	1,144.53
George street,..... Dwight to Day,	Matthew Kehoe,	314.2	15 in. C. P.	196.37		
George street,..... "	Matthew Kehoe,	206.7	12 in. C. P.	145.04	171.42	316.46
Greene street,..... Hughes Place to Academy street,	Laurence O'Brien,	196.0	15 in. C. P.	.....		
Hillhouse ave.,..... Corner of Grove street,	City,	92.6	12 in. C. P.	.....	466.77	883.06
Lock street,..... Canal street,	City,	100.0	15 in. C. P.	.....		
Martin street,..... " Dwight street,	Wm. Granfield,	35.5	15 in. C. P.	24.85	473.75	858.50
Martin street,..... Dwight to Day,	Wm. Granfield,	559.2	12 in. C. P.	391.44		
Rose Court,..... Corner of Broad street,	City,	36.6	15 in. C. P.	.....	147.00	166.54
Temple street,..... Chapel to Elm,	Laurence O'Brien,	446.0	15 in. C. P.	312.20		
Temple street,..... " "	Laurence O'Brien,	131.9	12 in. C. P.	72.55	41.96	280.64
Washington street,..... Corner of Cedar,	Laurence O'Brien,	26.4	15 in. C. P.	19.54		
William street,..... " Franklin,	Wm. Granfield,	88.4	24 in. Brick.	238.68	548.41	1,663.78
William street,..... Outlet,	Wm. Granfield,	413.1	24 in. Brick.	1,115.37		

STREET DEPARTMENT--STATEMENT NO. 2.
SEWER CONTRACTS COMPLETED IN 1878.

STREET.	Size and Material.	Average Cut. Feet.	Length. Feet.	Nature of Excavation.	Contract Price per Foot.
William street outlet,...	24 in. Brick.	15.7	413.1	Sand and Gravel...	\$2.70
William street, ...	24 in. Brick.	18.0	88.4	" "	2.70
Cedar street, ...	15 in. C. P.	11.3	357.5	Sand.	.74
Elliott's Lane, ...	15 in. C. P.	13.5	28.0	" and Gravel...	Built by City.
Franklin street, ...	15 in. C. P.	16.8	26.5	" "	\$2.00
George street, ...	15 in. C. P.	13.4	314.2	Sand.	1.10
Greene street, ...	15 in. C. P.	10.3	196.0	" and Gravel...	.74
Lock street, ...	15 in. C. P.	11.0	100.0	" "	Built by City.
Martin street, ...	15 in. C. P.	13.4	35.5	Sand.	.70
Rose Court, ...	15 in. C. P.	12.0	36.6	" "	Built by City.
Temple street, ...	15 in. C. P.	7.7	446.0	" "	.70
Washington s'treet, ...	15 in. C. P.	11.0	26.4	" "	.74
Cedar street, ...	15 in. C. P.	10.5	231.0	" "	.54
Franklin street, ...	12 in. C. P.	13.6	278.7	" and Gravel.	1.45
George street, ...	12 in. C. P.	11.9	206.7	Sand.	.95
Hillhouse avenue, ...	12 in. C. P.	10.0	92.6	" "	Built by City.
Martin street, ...	12 in. C. P.	11.3	559.2	" "	.70
Temple street, ...	12 in. C. P.	7.5	131.9	" "	.55

STREET DEPARTMENT—STATEMENT No. 3.
COMPARISON OF BIDS ACCORDING TO ESTIMATES OF QUANTITIES.

STREET.	BIDDERS.	Price.
Greene street, Hughes' Place to Academy street, }	{ Michael Brennan,.....	\$306.50
	{ Wm. Granfield,.....	256.50
	{ Wm. E. Davis,.....	253.50
	{ Laurence O'Brien,*.....	239.00
Cedar street, Prince to Gilbert street, }	{ Michael Brennan,.....	1,318.00
	{ Matthew Kehoe,.....	1,104.00
	{ Wm. E. Davis,.....	1,078.00
	{ Wm. Granfield,.....	916.00
	{ Laurence O'Brien,*.....	910.80
Martin street, Dwight to Garden street, }	{ Matthew Kehoe,.....	1,072.50
	{ Wm. E. Davis,.....	1,021.50
	{ Laurence O'Brien,.....	815.80
	{ Wm. Granfield,*.....	806.00
Temple street, Chapel to Elm street, }	{ Matthew Kehoe,.....	1,132.50
	{ Wm. E. Davis,.....	983.00
	{ Wm. Granfield,.....	903.00
	{ Laurence O'Brien,*.....	834.50
Franklin street, and William st. outlet, }	{ Davis & Fowler,.....	3,535.00
	{ Laurence O'Brien,.....	3,020.00
	{ Michael Brennan,.....	2,844.00
	{ Wm. Granfield,*.....	2,315.00

Total difference between highest and lowest, \$2,259.20.

* Awarded the contract.

STREET DEPARTMENT—STATEMENT NO. 4.

SHOWING STREETS PAVED IN 1878.

Street.	Location.	Contractor.	Kind of Pavement.	Length in feet.	Number of Square Yards.	*Cost per Square Yard.	Total Cost.
Chapel, ...	Church to Temple street,	G. Pohlman, ...	Belgian, ...	385	2,101.89	\$1.31	\$2,753.48
Chapel, ...	Temple to York street, ...	G. Pohlman, ...	{ Telford and Belgian, ...	1,403	6,755.16	1.16	7,835.99
East, ...	Greene to St. John street,	Richard Connor, ...	Telford, ...	407	1,404.04	1.13	1,586.56
Temple, ...	Chapel to Crown street, ..	Richard Connor, ...	Telford, ...	477	1,497.04	1.11	1,662.11

* Cost per square yard includes contract price, expense of rolling, inspector, etc.

STREET DEPARTMENT—STATEMENT No. 5.

COMPARISON OF BIDS FOR STREET PAVING IN 1878.

LOCALITY.	BIDDERS.	Price per Yard
Chapel street.....	D. A. Blakeslee,.....	\$1.65 $\frac{1}{2}$
Chapel street.....	Richard Connor,.....	1.60
Chapel street.....	Patrick Dowling,.....	1.57
Chapel street.....	G. Pohlman,*.....	1.23
Chapel street.....	Richard Connor,.....	1.47
Chapel street.....	Patrick Dowling,.....	1.36
Chapel street.....	D. A. Blakeslee,.....	1.35 $\frac{1}{2}$
Chapel street.....	Alling & Smith,.....	1.23
Chapel street.....	G. Pohlman,*.....	1.06
East street.....	Patrick Dowling,.....	1.03
East street.....	D. A. Blakeslee,.....	.96
East street.....	Richard Connor,*.....	.96
Temple street.....	Patrick Dowling,.....	1.09
Temple street.....	D. A. Blakeslee,.....	.94 $\frac{1}{2}$
Temple street.....	Richard Connor,*.....	.92

Total difference between highest and lowest bids, \$4,015.70.

* Awarded the contract.

STREET DEPARTMENT—STATEMENT No. 6.
SHOWING PAVEMENTS REPAIRED DURING 1878.

LOCATION.	Kind of Pavement.	Between what points.	Work done.	Cost.
Broadway,.....	Telford,.....	York street and Lower Green,.....	Repairs, Gutters, etc.,.....	\$223.79
Chapel street,.....	Telford,.....	York street to Sherman avenue,.....	Top dressed,.....	1,534.23
Chapel street,.....	Wood,.....	Church to Temple street,.....	Repairs,.....	14.00
Chapel street,.....	Belgian,.....	Church to Orange street,.....	Repairs of Gutters,.....	72.35
Crown street,.....	Wood,.....	Church to Temple street,.....	Repairs,.....	74.54
Crown street,.....	Telford,.....	State to Church street,.....	Repairs,.....	59.50
Church street,.....	Telford,.....	Chapel to George street,.....	Top dress and Gutters,.....	204.30
Congress avenue,.....	Telford,.....	George to Cedar street,.....	Top dressed,.....	2,285.42
Center street,.....	Telford,.....	Church to Temple street,.....	Repairs,.....	20.00
Elm street,.....	Telford,.....	State to College street,.....	Top dressed,.....	1,594.65
George street,.....	Telford,.....	State to Church street,.....	Repairs,.....	59.50
Olive street,.....	Telford,.....	Wooster to Chapel street,.....	Top dressed,.....	87.59
Orange street,.....	Telford,.....	Chapel street northerly 200 feet,.....	Repairs of Gutters,.....	29.12
Orange street,.....	Telford,.....	R. R. Bridge to Trumbull street,.....	Top dressed,.....	394.94
St. John street,.....	Telford,.....	Junction of Grand street,.....	Repairs,.....	53.49
St. John street,.....	Telford,.....	.....	Repairs,.....	26.00
Union street,.....	Wood,.....	Court to Chapel street,.....	Repairs,.....	194.55
Whalley avenue,.....	Telford,.....	Jewell to Blake street,.....	Repairs,.....	390.37
Wooster street,.....	Telford,.....	East to Olive street,.....	Top dressed,.....	1,291.76

STREET DEPARTMENT—STATEMENT No. 7.

SHOWING STREETS GRADED DURING 1878.

STREET.	Between what points.	Contractor.	Length in feet.	Number of Cubic Yards.	Cost per Cubic Yd.	Total Cost.
Beech street,*	Mill River street and Mill River,	City,	.....	188	\$0.20	\$37.60
Broad street,	Oak and George streets,	City,	500	583	.20	116.60
Canal street,*	Lock and Prospect streets,	City,	650	.....	.....	1,161.42
Carlisle street,	Water street and Union avenue,	City,	150	1,705	.20	341.00
Cedar Hill avenue,	State and Grace streets,	Richard Connor,	1,750	2,968	.12	356.16
Columbus avenue,	West and West River,	D. A. Blakeslee,	1,940	2,877	.18½	532.24
Commerce street,	Whiting and Water streets,	City,	.....	626	.20	125.20
Fawn street,	Middletown avenue and R. R. Tracks,	City,	770	.....	.....	597.75
Gregory street,*	Ashmun and Canal streets,	City,	260	1,624	.20	324.80
Haven street,	Clay and Market streets,	City,	295	432	.20	86.40
Hillhouse avenue,	Grove street and R. R. Bridge,	D. A. Blakeslee,	520	1,591	.39½	628.44
Hillhouse avenue,	Grove street and R. R. Bridge,	City,	.....	.....	.....	44.75
Hudson street,*	Goffe and Henry streets,	City,	.....	520	.20	104.00
James street,*	Alton and Lombard streets,	City,	.....	2,448	.20	489.60
May street,	State street and Cedar Hill avenue,	Richard Connor,	360	101	.12	12.12
Middletown avenue,*	Near Lewis' Bridge,	City,	.....	.....	.....	22.50
Osborn avenue,	Whalley avenue and Goffe street,	P. Boland,	880	2,965	.09	380.84
Prospect street,	Sachem and Lock streets,	City,	.....	295	.20	59.00
Warren Place,	State and View streets,	Richard Connor,	735	314	.12	37.68
Warren Place,	State and View streets,	Richard Connor,	.....	366	.37	135.42
Willow street,	Orange and Nicoll streets,	J. A. Kivlehan,	950	908	.13½	120.31
Winchester avenue,	Division and Read streets,	D. A. Blakeslee,	2,550	4,828	.21½	1,066.02

* Not completed.

STREET DEPARTMENT—STATEMENT NO. 8.
COMPARISON OF BIDS FOR STREET GRADING IN 1878.

LOCALITY.	CONTRACTOR.	Price per Yard.
Cedar Hill avenue,..... State to Grace street,.....	{ D. A. Blakeslee,..... Richard Connor,*..... John Hennesy,..... P. Boland,..... James Lord,..... John Nolan,..... Patrick Leonard,..... D. A. Blakeslee,*..... Thomas Colwell,..... Richard Connor,..... D. A. Blakeslee,*..... D. A. Blakeslee,..... Patrick Leonard,..... John Nolan,..... P. Boland,*..... D. A. Blakeslee,..... Richard Connor,*..... P. Boland,..... W. E. Davis,..... D. A. Blakeslee,..... Patrick Murry,..... James Donlen,..... J. A. Kivlehan,*..... Patrick Leonard,..... D. A. Blakeslee,*.....	\$0.18 .12 .19 .18 $\frac{3}{4}$.18 $\frac{3}{4}$.18 $\frac{3}{4}$.18 $\frac{3}{4}$.18 $\frac{1}{2}$.18 $\frac{1}{2}$.45 .44 .39 $\frac{1}{2}$.12 $\frac{1}{2}$.11 $\frac{3}{4}$.10 $\frac{3}{4}$.09 Earth, .18; Rock 1.25 " " .12; .37 .24 .24 .22 $\frac{1}{2}$.16 .14 $\frac{3}{4}$.13 $\frac{1}{2}$.31 .21 $\frac{1}{2}$
Columbus avenue,..... West to West River,.....		
Hillhouse avenue,..... Grove street to R. R. Bridge,.....		
Osborn avenue,..... Whalley avenue to Goffe street,...		
Warren Place,..... State to View street,.....		
Willow street,..... Orange to Nicoll street,.....		
Winchester avenue,..... Division to Read street,.....		

Total difference between highest and lowest bids, \$1,275.44.

*Awarded the contract.

STREET DEPARTMENT—STATEMENT No. 9.

SHOWING STREETS TURNPIKED DURING 1878.

Broad street,.....	\$14.05
Dixwell avenue,..	210.00
Division street,.....	20.00
Fair street,.....	112.49
First street,.....	10.00
Goffe street,.....	90.00
George street,.....	145.00
Grand street,.....	119.80
Highland street,.....	35.00
Howard avenue,.....	177.50
Hazel street,.....	54.37
Haven street,.....	86.40
Munson street,.....	45.00
Middletown avenue,..	44.99
Prospect street,.....	281.26
Rock road,.....	50.00
Sylvan avenue,.....	25.00
State street,.....	146.24
Suburban street,.....	145.00
Tyler street,.....	39.37
Washington street,.....	99.12
Whitney avenue,.....	74.95

STREET DEPARTMENT—STATEMENT NO. 10.
SHOWING REPAIRS ON BRIDGES DURING 1878.

NAME.	LOCATION.	Work done.	Cost.
Barnesville,.....	Grand street,.....	Repairs, ...	\$1,258.34
Chapel street,.....	Mill River,.....	Repairs,.....	960.84
Congress avenue,.....	West River,.....	Sluiceway,.....	62.40
Kimberly avenue,.....	West River,.....	Repairs,.....	8.15
Lewis Bridge,.....	Quinnipiac River,...	New Abutments,.....	758.57
Neck Bridge,.....	Mill River,.....	Repairs,.....	2.50
Orange street,.....	Mill River,.....	Repairs,.....	26.34
Quinnipiac,.....	Ferry street,.....	Repairs,.....	329.58
Quinnipiac,.....	Grand street,.....	Repairs,.....	1,375.99

STREET DEPARTMENT—STATEMENT NO. II.

SHOWING WORK ON PUBLIC PARKS DURING 1878.

PARK.	Work Done.	Cost.
Clinton Park,.....	Trees,.....	 \$22.50
Fountain Park,.....	Trees,.....	 2.50
Jocelyn Square,.....	New Fence,.....	\$2,440.00
Jocelyn Square,.....	Repairs on old Fence,.....	65.40
Jocelyn Square,.....	Repairs on Walks,.....	31.25—\$2,536.65
Old Green,.....	New Walk,.....	 314.26
Old Green,.....	Trees,.....	 3.75
Spireworth Square,.....	Repairs on Fence and Trees,.....	 49.96
Temple Park,.....	Trees,.....	 2.50
Wooster Square,.....	Trees,.....	 1.25
General work on Parks,.....	.....	..... 3,311.96

STREET DEPARTMENT—STATEMENT No. 12.

SHOWING GUTTERS COBBLED DURING 1878.

STREET.	Between what points.	Side.	Cost.
Columbus avenue, ...	Bond street to West River, ...	Both, ...	\$1,078.30
Congress avenue, ...	Near West Bridge, ...	Repairs, ...	333.47
Derby avenue, ...	Winthrop avenue to West street, ...	Both, ...	839.03
Davenport avenue, ...	Near West Bridge, ...	Repairs, ...	403.50
Davenport avenue, ...	Howard avenue to Vernon street, ...	South, ...	71.04
Fawn street, ...	R. R. Tracks 200 feet south, ...	West, ...	74.74
Front street, .....	.....	.....	39.03
George street, ...	Derby avenue to Winthrop avenue, ...	Both, ...	308.23
Norton street, ...	Near Derby avenue, ...	Repairs, ...	16.50
Prospect street, ...	Sachem and Division streets, ...	West, ...	342.59

STREET DEPARTMENT—STATEMENT No. 13.
SHOWING NEW CROSSWALKS LAID DURING 1878.

STREET.	LOCATION.	Side.
Artisan street,.....	Across Grand street,.....	East.
Auburn street,.....	“ Sylvan avenue,.....	East.
Ashmun street,.....	“ Gregory street,.....	East.
Blatchley avenue,.....	“ Wolcott street,.....	West.
Columbus avenue,.....	“ Hedge street,.....	South.
Columbus avenue,.....	“ Downes street,.....	North.
Columbus avenue,.....	Opposite St. Bernard Cemetery,.....	
Columbus avenue,.....	Across Downes street,.....	South.
Daggett street,.....	“ Congress avenue,.....	West.
Dickerman street,.....	“ Sperry street,.....	South.
Dixwell avenue,.....	“ Admiral street,.....	East.
Elliot street,.....	“ Oak street,.....	West.
Edgar street,.....	“ Putnam street,.....	West.
East street,.....	“ Grand street,.....	East.
Factory street,.....	“ Commerce street,.....	South.
First street,.....	“ Kimberly avenue,.....	South.
Hallock street,.....	“ Columbus avenue,.....	North.
Howard avenue,.....	“ Rosette street,.....	West.
Kimberly avenue,.....	“ Lamberton street,.....	North.
Lloyd street,.....	“ Wolcott street,.....	West.
Norton street,.....	“ Irving street,.....	West.
Orchard street,.....	“ Oak street,.....	East.
Poplar street,.....	“ Wolcott street,.....	East.
Portsea street,.....	“ Water street,.....	South.
Redfield street,.....	“ Congress avenue,.....	West.
Spring street,.....	“ Howard avenue,.....	North.
Vernon street,.....	“ Sylvan avenue,.....	West.
Washington street,.....	“ Spring street,.....	East.
Webster street,.....	“ Goffe street,.....	East.
Ward street,.....	“ Oak street,.....	West.
Wolcott street,.....	“ James street,.....	South.
Winthrop avenue,.....	“ Parmelee avenue,.....	West.

STREET DEPARTMENT—STATEMENT No. 14.

THE LIBRARY OF THE

SHOWING SIDEWALKS COMPLETED DURING 1878.

UNIVERSITY OF ILLINOIS

Streets.	Between what points.	Side.	Material.
Alton street,	Ferry path and James street,	Both,	Curb.
Chapel street,	High and York streets,	North,	relay.
Chapel street,	Gill street and Sherman avenue,	North,	relay.
Columbus ave.,	Howard avenue and Cedar street,	North,	Brick.
Columbus ave.,	Corner of Frank street,	South,	Brick.
Congress ave.,	Bond street and Davenport avenue,	North,	Brick.
Congress ave.,	Bond street and Columbus avenue,	South,	Brick.
Edgar street,	No. 20 and Putnam street,	West,	Brick.
Elliott street,	George street and Gilbert avenue,	East,	Curb.
Elm street,	Sherman avenue and Beers street,	Both,	Curb.
Fawn street,	Middletown avenue and R. R. Track,	West,	Curb.
Frank street,	Columbus avenue and Portsea street,	South,	Brick.
George street,	Winthrop and Derby avenues,	Both,	Curb.
Haven street,	Clay and Market streets,	East,	Concrete.
Hill street,	Prince and Water streets,	Both,	Brick.
Howard ave.,	Rosette street and Kimberly avenue,	West,	Brick.
Kimberly ave.,	Howard ave. and Lamberton street,	West,	Brick.
Kimberly ave.,	opposite Grant street,	East,	Curb.
Kimberly ave.,	100 ft. s. from Dr. Daggett's n. line,	East,	Curb.
Lawrence street,	Orange and State streets,	Both,	Curb.
Lawrence street,	Orange and Nicoll streets,	North,	Concrete.
Lloyd street,	Exchange and East Chapel streets,	West,	Concrete.
Mechanic street,	State and Lawrence streets,	Both,	Curb.
Norton street,	Irving street and Derby avenue,	West,	Concrete.
Oak street,	Tyler and 400 ft. west of Porter st.,	Both,	Curb.
Portsea street,	Meadow and West Water streets,	South,	Plank.
Prospect street,	Sachem street and R. R. Bridge,	Both,	Curb.
Sea street,	Howard avenue and Water street,	South,	Concrete.
Sherman ave.,	Chapel and Oak streets,	East,	Curb.
Spring street,	Howard avenue and Dewitt street,	North,	Brick.
Tyler street,	Oak street and south terminus,	Both,	Curb.
Washington st.,	Liberty and Morris streets,	Both,	Brick.
Whitney ave.,	Sachem and Cliff streets,	West,	Curb.
Willow street,	Orange and Nicoll streets,	Both,	Curb.
York street,	Chapel and Elm streets,	East,	relay.

Total length, 7.9 miles.



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ANNUAL REPORTS

OF THE

Street Department

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CITY OF NEW HAVEN, CONN.,

FOR THE YEAR 1880.

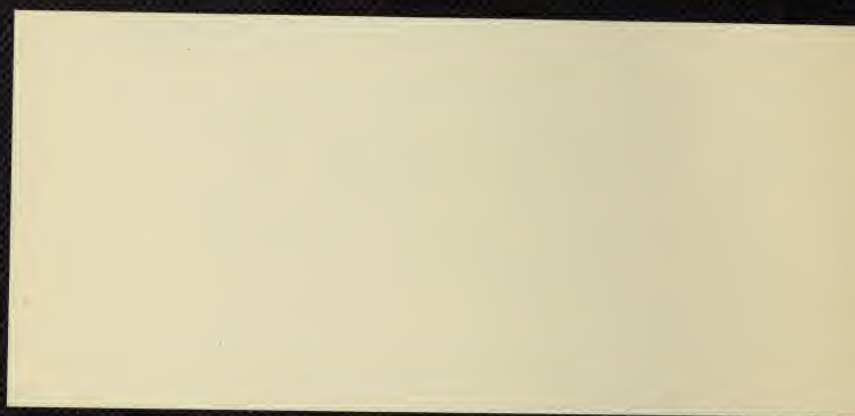
NEW HAVEN:

O. A. DORMAN, PRINTER AND MANUFACTURING STATIONER, 196 CHAPEL ST.
1881.

With the compliments of

Charles C. Fowler,

City Surveyor.



ANNUAL REPORTS

OF THE

Street Department

OF THE THE LIBRARY OF THE

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UNIVERSITY OF ILLINOIS

CITY OF NEW HAVEN, CONN.,

FOR THE YEAR 1880.

NEW HAVEN:

O. A. DORMAN, PRINTER AND MANUFACTURING STATIONER, 196 CHAPEL ST.
1881.

BOARD OF ROAD COMMISSIONERS.

PRESIDENT.

PHILO CHATFIELD.

Term expires Feb. 1, 1883.

Residence, 19 Lyon st.

ISAAC ANDERSON.

Term expires Feb. 1, 1881.

Residence, 113 Chapel st.

JONATHAN W. POND.

Term expires Feb. 1, 1881.

Residence, 99 St. John st.

LOUIS FELDMAN.

Term expires Feb. 1, 1882.

Residence, 164 Olive st.

MICHAEL COLEMAN.

Term expires Feb. 1, 1883.

Residence, 58 Houston st.

CLERK.

FRED. H. WALDRON.

Regular meetings on Wednesday before the first Thursday in each month, at
Room No. 17, City Hall, at 7:30 P. M.

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REPORT

OF THE

BOARD OF ROAD COMMISSIONERS.

To the Honorable Court of Common Council :

Herewith please find the Annual Report of the Board of Road Commissioners for the year ending Nov. 30, 1880.

This Board have received from your honorable body sixty-eight orders, petitions, etc., as follows :

27 for walks and curbs.	2 for paving streets.
13 " sewers.	3 " layouts of streets and parks.
4 " grading streets.	2 " fencing parks.
2 " cobble gutters.	15 " miscellaneous.

Thirty-eight meetings have been held by the Board at their office.

Twenty-two contracts have been awarded in public meeting, all to the lowest bidder.

BRIDGES.

There has been but little work done on the several bridges under the charge of this Board during the past year, beyond the ordinary repairs.

Barnesville Bridge, so called, which spans Mill River at Grand street, will require considerable work during the coming year, and this Board would recommend, in order to make a permanent structure, that one of the spans this year be rebuilt with iron floor beams and stone abut-

ments, and the other with the same material at some future time.

Quinnipiac Bridge has been opened during the eleven months ending Nov. 30, 3,804 times, for the following craft : Schooners 275, steamers 1,421, sloops 694, sharpies 1,414.

Chapel Street Bridge has been opened 2,638 times during the same period, for the following craft : Tugs 1,622, barges 598, schooners 199, sloops 93, scows 126.

A detailed monthly report will be found by reference to Statement No. 15.

GRADING STREETS.

The most extensive grading which was done during the year was on Blake street, from Whalley avenue to the City line; 4,952 cubic yards of earth were moved, at a cost of $21\frac{1}{2}$ cents per yard. The length of street graded was 1,673 feet, and the deepest cut was about seven and one-half feet. As the roadway, previous to grading, was hardened or paved, the material which could again be used for this purpose was put back, together with enough new material to put the roadway in good condition. The total cost of the grading and hardening was \$3,110.83.

The whole, or portions of Hudson, Hurlburt, James, Laurel, Lloyd, Linden, Middletown avenue, Norton, Percival, Stevens, Sherman avenue, View and Wilson streets, and the approach to Quinnipiac Bridge,* have been graded.

PAVING STREETS.

New pavements have been constructed on Water street, from East to Franklin streets. The order for paving this street extended from Bridge street to the railroad crossing, near Custom House square, but owing to a lack of funds, only the three blocks above mentioned were paved. The balance of the order will be carried out early in the coming year.

A Belgian block pavement has been laid on Union street,

from Wooster to Court street, in place of the Brocklebank and Trainor wood pavement, which was worn out, having been in use for the past nine years.

The only wood pavement now remaining in the City is on Crown street, from Church to Temple street, one block. This is in very bad condition, and the City Inspector recommends that it be taken up the coming year and a stone pavement put in its place.

The length of pavements added during the past year has been 1,057 feet, making the total length of paved streets at this time in the city $13\frac{47}{1000}$ miles.

Pavements have been repaired and top-dressed on seventeen streets, as will be found by reference to Statement No. 6.

PUBLIC PARKS AND TREES.

Hamilton Place Park has been fenced, in accordance with orders from your honorable body.

One section of Clinton Park has been graded, fenced, and new trees set out, making three of the sections completed, leaving but one to be graded and fenced.

Walks have been repaired, &c., as will be seen by the detailed statement below.

This Board have orders for fencing Munson Park and for concrete walks on Spireworth Square, which will be carried out early in the coming year.

This Board have received from your honorable body an order for a layout of the proposed East Rock Park.

Several meetings have been held in conjunction with the Park Commission, at which time parties owning lands within the limits of the proposed park have been heard in accordance with the law.

The layout will soon be adopted, and a written description and survey submitted to your honorable body.

The amount expended upon the Parks during the year is as follows:

GENERAL WORK ON PARKS.

Salary Superintendent,	\$999.96	
Labor,	1,609.55	
Carting,	487.78	
Tree protection,	164.80	
Flagstaffs,	54.15	
Repairs of pumps,	28.12	
Tools,	220.29	
		\$3,564.65

JOCELYN SQUARE.

Laurel street walks,	\$97.15	
Wallace " "	96.20	
Trees and boxes,	32.10	
		\$225.45

SPIREWORTH SQUARE.

Repairs of fences,	\$14.71
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CLINTON PARK.

Fences and painting,	\$310.54	
Trees,	144.00	
Grading,	253.00	
		\$707.54

HAMILTON PLACE.

Fence,	\$440.00	
Repairing walks,	25.64	
		\$465.00

WOOSTER SQUARE.

Repairing walks,	\$36.63	
" fences,	25.00	
		\$62.27

OLD GREEN.

Repairing central walk,	\$421.47	
		\$5,461.09

STONE CRUSHER.

There have been 7,279.4 cubic yards of stone crushed at the crushing works during the past year.

One new Blake Challenge Crusher, 9 inches by 15 inches, has been purchased, to take the place of one of the old style crushers which was broken. The new crusher will be placed in position during the coming winter, ready for use as soon as the works are put in operation.

A smaller crusher of this kind has been in use during the past year, and has given good satisfaction.

The insurance of \$4,000 has been continued on these works.

SEWERS.

Sewers have been constructed in the following streets and avenues :

Whalley avenue—Winthrop avenue to Norton street.

“ “ north side—County to Orchard street.

“ “ south side—Garden street, westerly.

William street—Olive to Franklin.

Court street—State to Olive.

College street—Wall to Grove.

Lafayette street—Prince to Silver.

Elm street—Park street, easterly.

Lyon street—Jefferson to Bradley.

Union street—Chapel to Court.

“ “ Fair to Chapel, rebuilt.

State street—East to Mill River street.

Norton street—Corner of Whalley avenue.

Lincoln street—Corner of Trumbull street.

The length of these sewers is 6,099.9 feet.

There were 590 feet of sewers destroyed in Union street when the new sewer was constructed. This makes an addition of $1\frac{44}{1000}$ miles, or $35\frac{181}{1000}$ miles of sewers in use at the present time.

MISCELLANEOUS.

The total amount appropriated to this department for the year 1880 was \$106,000.00; of this amount \$105,258.45 was expended.

There was received and paid into the City Treasury the following amounts, which should be credited to this department :

By the Collector, for street assessments, ...	\$7,189.38
“ “ “ sewer “	13,506.66
“ City Inspector, for permits, cobble gutters, etc., ...	2,889.27
Improvements secured by liens (City Inspector), ...	931.90
Total, ...	<u>\$24,517.21</u>

This amount, which, if credited to this department, would have made the net expenditure of \$80,541.24.

There are quite a number of orders in the hands of this Board to be executed during the coming year, which were not carried out, owing to a lack of funds. Had the Board been permitted to have used the above amounts returned by assessments, most of the orders could have been executed.

Many of our citizens labor under the misapprehension that the appropriation asked for each year by this Board is the net amount required for running the department, whereas, it is the gross amount ; and if the moneys which are received from pavement and sewer assessments, and opening and widening streets, also the amount received through the City Inspector for permits, cobble gutters, etc., could be credited to this department, it would materially lessen the amount of appropriation asked for by this Board.

Respectfully submitted, in behalf of the Board of Road Commissioners.

FRED. H. WALDRON, *Clerk.*

REPORT
OF THE
CITY SURVEYOR.
1880.

CITY ENGINEER DEPARTMENT.

City Surveyor's Office : Room No. 17, City Hall.

Asst. Engineer's Office : Room No. 18, City Hall.

Draughting Room : Room No. 24, City Hall.

CITY SURVEYOR.

CHARLES E. FOWLER, Residence, 374 Whalley Avenue.

FIRST ASSISTANT ENGINEER.

ALBERT B. HILL, . . Residence, 176 York Street.

ASST. ENGINEER IN CHARGE OF SEWERAGE WORK.

CHARLES A. FERRY, . Residence, 104 Liberty Street.

ASST. ENGINEER IN CHARGE OF STREET WORK.

CASSIUS W. KELLY, . Residence, 105 Howe Street.

ASST. ENGINEER IN CHARGE OF SURVEYS AND MAPS.

F. FLOYD WELD, . . Residence, 32 Gilbert Avenue.

SEWER INSPECTORS.

EDWARD DILLON, . . Residence, 237 Lombard Street.

THOMAS F. GRANDFIELD, . Residence, 24 Gill Street.

REPORT

OF THE

CITY SURVEYOR.

To the Honorable Board of Road Commissioners :

I have the honor to submit my twelfth annual report of the work of the City Engineer Department.

In addition to the report proper, which comprises an account of the work for the year 1880, I have added a brief summary of the work of the Road Department for the term of ten years just closed.

SEWERAGE.

Sewers were built during the year in the following streets, viz :

College, Court, Elm, Grove, Lafayette, Lincoln, Lyon, Norton, State, Union, Water, William and Whalley Avenue:

The total length laid was $6,099\frac{9}{10}$ feet, or $1\frac{1\frac{5}{10}6}{1000}$ miles.

This amount was divided among the different sizes, as follows :

24 inch Brick Sewer,	.	.	.	.	1798 $\frac{9}{10}$ feet.
15 " pipe "	.	.	.	.	2084 $\frac{4}{10}$ "
12 " " "	.	.	.	.	2216 $\frac{6}{10}$ "

In rebuilding the old sewer in Union street, between Fair and Chapel street, it became necessary to destroy 590 feet in length, so that the net increase in the length of sewers was $5509\frac{9}{10}$ feet, or $1\frac{44}{1000}$ miles. This, added to the

$34\frac{137}{1000}$ miles of sewers in use at the beginning of the year, makes $35\frac{181}{1000}$ miles in use at the present time.

The details of the sewer work for the year will be found in the Street Department Statements, Nos. 1, 2 and 3.

CLEANING AND REPAIRS OF SEWERS.

With but few exceptions our sewers are in excellent condition. During the early part of the year a very thorough examination of all the sewers was made, and all needing cleaning were attended to. This work was performed under the direction of Sewer Inspectors Dillon and Grandfield, and they have also made during the year such repairs to the sewers, basins, etc., as were found necessary.

With our improved tools and arrangements for cleaning and flushing, we are able to perform our work of sewer cleaning at a comparatively small cost.

STREET PAVEMENTS.

At the commencement of the year there was in actual use $13\frac{276}{1000}$ miles of paved streets. The addition to the list of paved streets has been the paving of Water street, between East and Franklin streets, a length of 1,057 feet or $0\frac{2}{10}$ mile. The old pavements on Union street, between Wooster and Court streets, and on Chapel and Wooster streets, at the corners of Union street, were taken up and relaid with Belgian pavement. The old McAdam pavement on Blake street was also relaid with Telford pavement.

The total length of paved streets at the present time is $13\frac{476}{1000}$ miles, divided as follows:

Telford pavement,	.	.	.	.	.	$10\frac{128}{1000}$	miles.
Belgian	"	.	.	.	.	$2\frac{827}{1000}$	"
Wood	"	.	.	.	.	$0\frac{052}{1000}$	"
Concrete	"	.	.	.	.	$0\frac{308}{1000}$	"
Cobble	"	.	.	.	.	$0\frac{161}{1000}$	"
Total,	.	.	.	.	.	$13\frac{476}{1000}$	"

The accompanying statements, Nos. 4, 5 and 6, give the details of the pavement work for the year.

STREET GRADING.

The whole or portions of fifteen different streets were graded during 1880. This does not include those streets where light work was done by the force under the City Inspector, that being classed under the head of "Turnpiking Streets." Of the fifteen streets graded the work on ten of them was done by contract, and on the other five by or under the direction of the City Inspector.

The contract work varied in price from 8 cents per cubic yard to $21\frac{1}{2}$ cents per cubic yard excavation, the average price for the year being 14 cents for the excavation, removal and completion of the roadway.

The total length of streets graded was 9,413 feet, or $1\frac{783}{1000}$ miles, and in statements Nos. 7 and 8 will be found the details of the work.

COBBLE GUTTERS.

Gutters on Goffe street, Middletown avenue and Washington street were paved with cobble stone, the total amount laid being 16,440 square feet.

WALKS AND CURBS.

Lines and grades have been given for the setting or re-setting of curbstones, laying or relaying of sidewalks, grading of walks, etc. wherever directed by the Board or asked for by the owners of adjoining lands. The total length of this work for the year amounts to 41,818 feet, or $7\frac{92}{100}$ miles.

SURVEYS AND MAPS.

Surveys have been made and maps prepared in all cases where the same have been required by the Board of

Road Commissioners, the Board of Compensation for the opening and widening of streets, the Board of Compensation for the assessment of sewers and pavements, and by the various Committees of the Court of Common Council. In most cases the names of the owners of the lands are furnished, and their title to the same verified by a careful search of the land records of the Town. The work of the greatest magnitude in this line has been the surveys, etc., for East Rock Park, referred to hereafter.

MERE STONES.

Although considerable work was done during the year, in locating street lines and corners, our other duties were such that no opportunity was given for the setting of "mere stones." We have now all the information required to enable us to set quite a number in the coming spring.

EAST ROCK PARK.

During the latter part of the year a large portion of the time of the City Engineer Department was occupied with work preliminary to the laying out of "East Rock Park." The limits of the park, as at first proposed, covered an area of over four hundred acres, a little over half of it being within the limits of the town of Hamden. The only map we had of the entire territory that was at all reliable was the one made for the City of New Haven by the United States Coast Survey, in the year 1877, and drawn to a scale of $\frac{1}{100000}$, or 833 $\frac{1}{3}$ feet to an inch. Although this map served an excellent purpose for giving a general idea of the shape and extent of the proposed park, the small scale and almost entire absence of the details required, rendered it of but little use for our purpose. It therefore became necessary to commence work on an accurate and thorough survey of the entire tract and surroundings, which was done at the earliest practicable moment, and

continued, as other duties would permit, until the close of the year. The location of the division lines between the lands of different owners has been a work of more than ordinary difficulty, from the fact that, in many cases, there is nothing on the ground to designate the boundaries, and owners themselves are unable to definitely locate them. In such cases it has been necessary to make a very careful search of the land records, and trace the title from the original grantee down to the present owner—a long and tedious work. The result of this work has, however, been very satisfactory, for we have been able to locate the boundaries of, not only the private lands, but most of the public lands on East Rock, concerning which there had been much doubt.

In order that the proper notice for a hearing before the Board of Road Commissioners should be served upon all parties affected by the taking of lands, the owners of the lands within the limits of the proposed park were ascertained, and in most cases the titles to the same were verified by a careful search of the land records of the town. It was found that the lands were owned by about one hundred and twenty-five different parties—the tracts varying in size from a small building lot to one of several acres. The parties in interest having been duly notified, hearings were had during the month of November for the purpose of receiving such objections as the owners desired to present, and for the purpose of determining upon the boundaries of the park. Within the limits of the proposed park were included lands already given to the City of New Haven, for the park, as follows: John W. Bishop, about 49 acres; George Gunn, about $4\frac{1}{2}$ acres; Edward Dillon, about half an acre; in all about 54 acres. And also lands promised to be given, as follows: Yale College, about $22\frac{1}{2}$ acres; James H. Woodhouse, 8 acres; Horace Atwater, 4 acres, and possibly some from others.

The extreme length of the park as proposed, from north to south, is a little over one and a half miles, and averages about half a mile in width.

NUMBERING STREETS.

In accordance with orders of the Board of Aldermen, the following streets have been numbered or re-numbered, viz.: Broad street, Eagle street, Mansfield street, Mill River street, Second street, Whalley avenue, and York street.

To carry out the orders, 418 notices were prepared and served upon the owners or occupants of the buildings, or parts of buildings, on said streets. In addition to this, upon the application of individuals, fifty-three buildings or parts of buildings, in different parts of the city, have been numbered.

MISCELLANEOUS WORK.

The City Engineer Department has been called upon, as usual, for a considerable amount of miscellaneous work, such as special surveys, maps, estimates, reports, etc., upon various matters required by the different Boards and Committees of the City Government, and for lines, grades, etc., for buildings and other improvements. The orders or requests are complied with in all cases, where it is proper that the work should be done, by this Department.

CONCLUSION.

In conclusion, I beg leave to submit a very brief review of the principal portions of the work of the Road Department for the ten years and five months ending Dec. 31, 1880. I am obliged to include in this review the last five months of the year 1870, because the accounts and reports for the year 1871 include them.

On the first of August, 1870, the City of New Haven had $5\frac{6.13}{1000}$ miles in length of paved streets, and $8\frac{5.86}{1000}$ miles of sewers. From that date to the present time, there has been added, not including the pavements and sewers rebuilt, $7\frac{8.63}{1000}$ miles of paved streets, and $26\frac{5.95}{1000}$ miles of sewers. Thus it will be seen that during the ninety-seven

years of our existence as a city, fifty-eight per cent. of the street pavements, and seventy-six per cent. of the sewers, have been constructed during the last ten years and five months.

Since August 1, 1870, a little over fifty miles in length of streets have been graded or regraded, and most of the work done under contract.

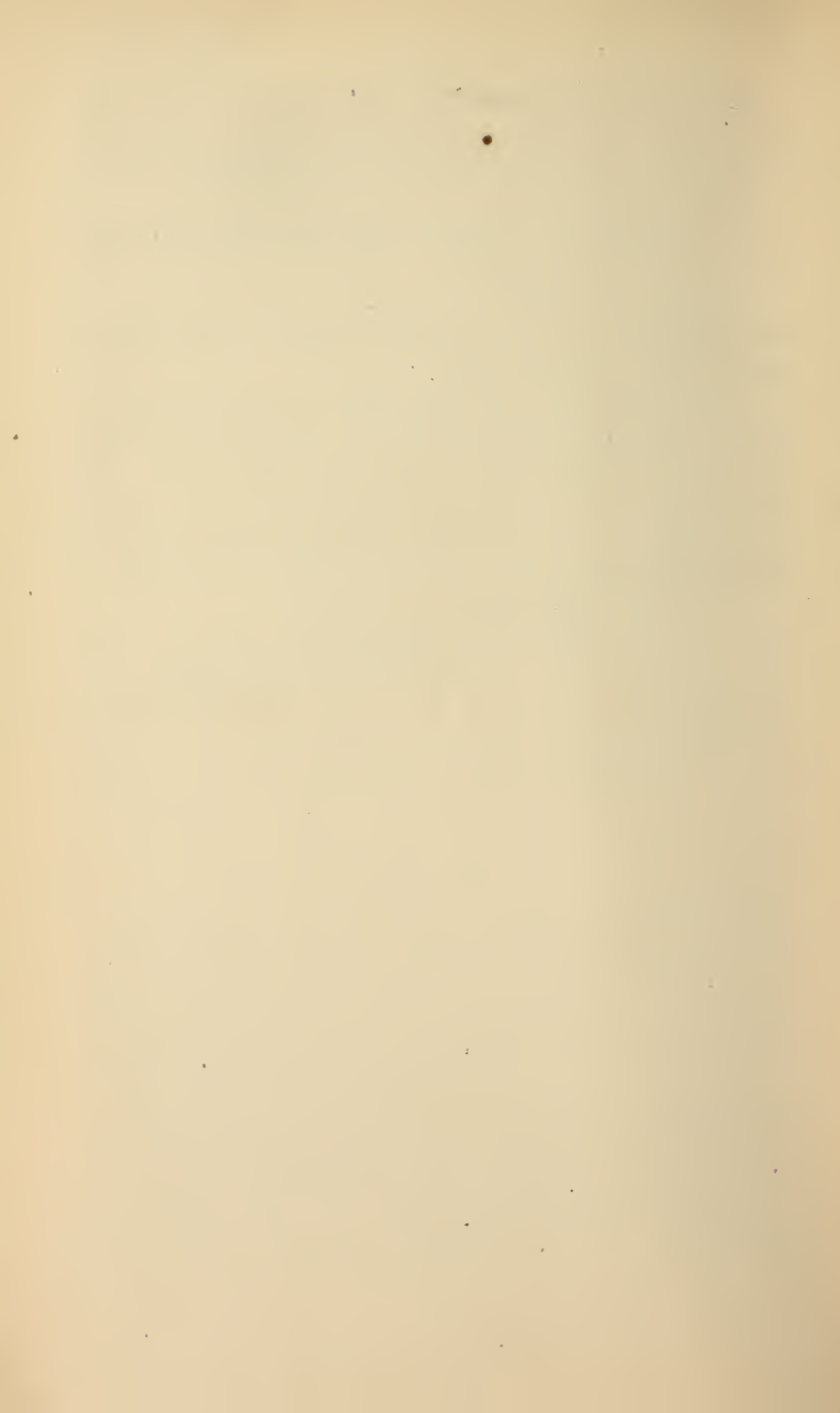
Ten years ago there was no good map of the City in the possession of the Department, and but very few special maps of any particular value.

Since that time, a very thorough and systematic survey of the entire city has been made, and maps made showing all streets, buildings, fences, railroads, wharves, etc. Our surveys were made to connect with the work of the United States Coast Survey, and have been incorporated with the work of that department in the publication of the charts of New Haven and vicinity.

Respectfully submitted,

CHARLES E. FOWLER.

City Surveyor.



REPORT
OF THE
CITY INSPECTOR.
1880.

CITY INSPECTOR'S DEPARTMENT.

Office, Room No. 17, City Hall.

CITY INSPECTOR.

PATRICK DOYLE.

Term expires Nov. 9, 1882.

Residence, 210 Ferry st.

CLERK.

FREDERICK H. WALDRON.

Term expires Nov. 9, 1882.

Residence, 105 Howe st.

SUPERINTENDENT OF PARKS.

HENRY F. ANDRUSS.

Residence, 80 Chapel street.

INSPECTOR OF SIDEWALKS.

HENRY J. MATTOON.

Residence, 142 Bradley street.

REPORT
OF THE
CITY INSPECTOR.

To the Honorable Board of Road Commissioners :

In accordance with the usual custom I herewith submit a brief report of my doings during the year ending Nov. 30, 1880.

I have had on an average about twenty-eight men daily at work in my department during the past year.

Cobble gutters have been constructed on Middletown avenue, Goffe and Washington streets, and relaid on George street, between Church and College streets. Repairs have been made in various parts of the city at a cost of \$364.80.

Forty-four new crosswalks have been constructed in accordance with orders from your Honorable Body, and quite a number relaid and otherwise repaired.

I have kept the Telford pavements in repair by filling the holes and ruts with crushed stone, without the use of the roller. This works very well when there is only a thin layer of stone required for repairs.

The wood pavement on Crown street, from Church to Temple streets, is in a dangerous condition. It is beyond repair. I would respectfully suggest that the attention of the Common Council be called to this fact, and that the pavement be taken up and replaced with stone. I have endeavored to keep the most dangerous spots as safe as possible.

This is the only wood pavement now in the city, and the money expended on repairs would be economy if placed in a new pavement.

Hurlburt, Laurel, Lloyd, Linden and Wilson streets, have been graded by days' work; the grading of these streets was necessary to carry out the orders from the Court of Common Council for curbing the walks.

There have been $6\frac{227}{1000}$ miles of walks graded or paved during the past year, in accordance with orders. In addition thereto, the following work has been done by adjoining proprietors, under the supervision and solicitation of the Sidewalk Inspector: 765 feet of brick relay, 349 feet of flag relay, to take the place of brick walk, 132 feet of concrete relay, 434 feet of curb reset, 133 repairs around cellar doors, coal holes, &c., 46 corners to meet crosswalks.

There has been but little work required on the several bridges, beyond the ordinary repairs of the same. One of the spans of Barnesville Bridge has been replanked, at a cost of \$314.63. It will be necessary during the coming year to make some extensive repairs on this bridge, or replace the same with a new structure.

I have placed thirty-seven liens on property during the past year for removing snow, constructing cobble gutters, walks and curbs, &c., eight of which have been discharged.

Respectfully submitted,

P. DOYLE, *City Inspector.*

STREET DEPARTMENT—Statement No. 1.

WORK ON SEWERS IN 1880.

STREET.	Contractor.	Length.	Size and Material.	Cost of Sewer.	Cost of Appurtenances.	Total Cost.
College street....	Wm. Grandfield	337.1	24 in. B. 4 in. I.	\$758.48	\$201.55	\$960.03
Court street....	Lawrence O'Brien	29.1	15 in. C. P.	36.38	}	793.95
Court street....	Lawrence O'Brien	385.2	12 in. C. P.	385.20	}	532.34
Elm street....	Matthew Kehoe.	206.4	12 in. V. P.	337.36	}	412.58
Grove street....	Wm. Grandfield	81.6	24 in. B. 4 in. I.	183.60	}	912.46
Grove street....	Wm. Grandfield	5.	15 in. C. P.	8.00	}	215.03
Lafayette street..	Matthew Kehoe..	406.	15 in. V. P.	507.50	}	595.77
Lincoln street....	Built by the City.	34.2	12 in. C. P.	57.12	}	599.13
Lyon street....	Lawrence O'Brien	45.7	15 in. V. P.	303.56	}	1,054.82
Lyon street....	Lawrence O'Brien	289.1	12 in. V. P.	189.00	}	2,924.18
Norton street....	Wm. Grandfield	63.	24 in. B. 8 in. I.	25.75	}	Not completed.
Norton street....	Wm. Grandfield	20.6	15 in. C. P.	489.92	}	308.04
State street....	Wm. E. Davis..	362.9	12 in. V. P.	951.86	}	566.00
Union street....	Wm. Grandfield	366.1	24 in. B. 8 in. I.	538.95	}	1,098.10
Union street....	Wm. Grandfield	359.3	15 in. V. P.	517.27	}	3,622.39
Union street....	Wm. Grandfield	449.8	12 in. V. P.	378.00	}	
Water street....	Wm. Grandfield	280.	15 in. V. P.	447.80	}	
Whalley avenue..	Wm. Grandfield	331.7	15 in. V. P.	21.63	}	
Whalley avenue..	Wm. Grandfield	20.6	12 in. V. P.	311.64	}	
Whalley avenue..	Wm. Grandfield	296.8	12 in. V. P.	861.12	}	
Whalley avenue..	Wm. Grandfield	374.4	24 in. B. 4 in. I.	1,499.42	}	
William street...	Lawrence O'Brien	576.7	24 in. B. 4 in. I.	667.70	}	
William street...	Lawrence O'Brien	607.	15 in. C. P.	145.86	}	
William street...	Lawrence O'Brien	171.6	12 in. C. P.		}	

STREET DEPARTMENT—Statement No. 2.

SEWER CONTRACTS COMPLETED IN 1880.

STREET.	Size and Material.	Average Cut.	Nature of Excavation.	Contract Price per Foot.
College street....	24 in. B. 4 in. I.	10.3	Sand.....	\$2.25
Grove street....	24 in. B. 4 in. I.	9.8	Sand.....	2.25
Norton street....	24 in. B. 8 in. I.	13.0	Sand.....	3.00
Union street....	24 in. B. 8 in. I.	12.1	Old Sewer Rebuilt, Telford Pavement,	
Whalley avenue, Winthrop ave. to Norton st.	24 in. B. 4 in. I.	13.2	Sand and Water.....	2.60
William street... Franklin to Osborne street...	24 in. B. 4 in. I.	14.3	Telford Pavement and Sand.....	2.30
Court street....	15 in. C. P.	10.1	Sand and Gravel.....	2.60
Grove street....	15 in. C. P.	10.2	Sand and Belgian Pavement.....	1.25
Norton street....	15 in. C. P.	12.8	Sand.....	1.60
William street... Corner of Whalley avenue...	15 in. C. P.	11.2	Sand.....	1.25
Lafayette street... Osborne to Olive street....	15 in. C. P.	11.3	Sand and Gravel.....	1.10
Lyon street....	15 in. V. P.	11.2	Sand.....	1.25
Union street....	15 in. V. P.	12.6	Sand and Gravel.....	1.25
*Water street.... East to Bridge street.	15 in. V. P.	6.0	Old Sewer Rebuilt, Wood Pavement,	1.50
Whalley avenue, S. side, Garden st., westerly.	15 in. V. P.	10.7	Sand and Water.....	1.35
Court street.... State to Orange street.....	12 in. C. P.	10.4	Sand.....	1.35
Lincoln street....	12 in. C. P.	12.0	Sand and Gravel.....	1.00
William street... Corner of Trumbull street...	12 in. C. P.	9.1	Sand and Gravel.....	Built by City
Elm street....	12 in. V. P.	12.2	Sand.....	.85
State street....	12 in. V. P.	10.3	Sand.....	1.15
Union street....	12 in. V. P.	10.1	Sand and Gravel.....	1.05
Whalley avenue, S. side, Garden st., westerly.	12 in. V. P.	11.4	Sand and Gravel.....	1.35
Whalley avenue, S. side, Garden st., westerly.	12 in. V. P.	10.3	Wood Pavement and Sand.....	1.15
Whalley avenue, N. side, Orchard to County st.	12 in. V. P.	10.6	Sand.....	1.05

* Not Completed.

STREET DEPARTMENT—Statement No. 3.

COMPARISON OF BIDS FOR SEWERS.

LOCATION.	Contractors.	24 in. Sewer. 8 in. I.	24 in. Sewer. 4 in. I.	15 in. Sewer.	12 in. Sewer.	Culverts. 12 in.	Catch Basins.	Receiving Basins.	Manholes.	Total Bid according to Estimates of Quantities.
College and Grove st.	{ Michael Fitzpatrick.....	.....	\$2.50	\$1.10	.....	\$0.90	\$125.00	.....	\$40.00	\$1,483.00
	{ Lawrence O'Brien.....	.....	2.40	1.00	.....	.80	80.00	.....	34.00	1,368.00
	{ William E. Davis.....	.....	2.30	1.50	.....	.90	100.00	.....	45.00	1,381.00
	{ William Grandfield*.....	.....	2.25	1.60	.....	.85	100.00	.....	40.00	1,341.50
Court st.	{ William E. Davis.....	.....	.....	2.00	\$1.50	1.00	105.00	.....	45.00	975.00
	{ Michael Fitzpatrick.....	.....	.....	1.65	1.45	1.00	100.00	.....	50.00	959.50
	{ William Grandfield.....	.....	.....	1.60	1.40	1.00	100.00	.....	40.00	898.00
	{ Lawrence O'Brien*.....	.....	.....	1.25	1.00	.90	90.00	.....	32.00	682.50
Elm st.	{ William E. Davis.....	.....	.....	.....	1.60	.90	105.00	.....	45.00	542.00
	{ William Grandfield.....	.....	.....	.....	1.50	1.00	105.00	.....	37.00	509.00
	{ Lawrence O'Brien.....	.....	.....	.....	1.30	1.00	90.00	.....	38.00	456.00
	{ Matthew Kehoe*.....	.....	.....	.....	1.15	.80	100.00	.....	38.00	430.00
Lafayette st.	{ William E. Davis.....	.....	.....	1.75	.....	1.25	100.00	.....	45.00	1,036.00
	{ William Grandfield.....	.....	.....	1.39	.....	.90	103.00	.....	35.00	868.00
	{ Matthew Kehoe*.....	.....	.....	1.25	.....	.80	95.00	.....	38.00	798.00
	{ William E. Davis.....	.....	.....	1.65	1.35	.90	.....	.....	45.00	609.00
Lyon st.	{ William Grandfield.....	.....	.....	1.65	1.35	1.00	.....	.....	37.00	588.00
	{ Matthew Kehoe.....	.....	.....	1.30	1.10	.80	.....	.....	39.00	503.00
	{ Lawrence O'Brien*.....	.....	.....	1.25	1.05	.85	.....	.....	34.00	473.50
	{ William E. Davis.....	.....	.....	1.25	1.05	.85	.....	.....	34.00	473.50

*Awarded the Contract.

STREET DEPARTMENT—Statement No. 3.—(Continued.)

COMPARISON OF BIDS FOR SEWERS.

LOCATION.	Contractors.	24 in. Sewer. 8 in. I.	24 in. Sewer. 4 in. I.	15 in. Sewer.	12 in. Sewer.	12 in. Culverts.	Catch Basins.	Receiving Basins.	Manholes.	Total Bid according to Estimates of Quantities.
State st.	{ Matthew Kehoe.....	.....	.....	.....	\$1.75	\$1.25	\$110.00	.....	\$45.00	\$1,065.00
	{ William E. Davis*.....	.....	.....	.....	1.35	1.00	110.00	.....	45.00	904.50
Union st.	{ Matthew Kehoe.....	\$3.50	.....	\$1.75	1.20	1.00	110.00	\$10.00	45.00	2,925.00
	{ William E. Davis.....	2.95	.....	1.50	1.15	1.00	100.00	12.00	43.00	2,588.50
	{ William Grandfield*.....	2.60	.....	1.50	1.15	.90	100.00	10.00	33.00	2,380.00
Water st.	{ Lawrence O'Brien.....	.....	.....	1.50	.....	1.00	135.00	10.00	35.00	1,285.00
	{ William Grandfield*.....	.....	.....	1.35	.....	.80	120.00	14.00	35.00	1,151.00
Whalley ave.	{ William E. Davis.....	.....	.....	1.60	1.30	.90	100.00	.....	45.00	1,370.00
	{ Matthew Kehoe.....	.....	.....	1.40	1.20	.85	100.00	.....	40.00	1,247.50
	{ William Grandfield*.....	.....	.....	1.35	1.05	.90	103.00	.....	35.00	1,168.50
Whalley ave. and Norton st.	{ Michael Fitzpatrick.....	3.80	\$3.45	1.85	.....	1.20	150.00	.....	45.00	2,119.50
	{ William E. Davis.....	3.25	2.85	2.00	.....	.90	100.00	.....	45.00	1,735.50
	{ Lawrence O'Brien.....	3.20	2.45	1.25	.....	.75	90.00	.....	38.00	1,510.50
	{ William Grandfield*.....	3.00	2.30	1.25	.....	.90	105.00	.....	40.00	1,496.50
William st.	{ Michael Fitzpatrick.....	.....	2.90	1.25	1.25	.90	140.00	.....	55.00	3,920.50
	{ William E. Davis.....	.....	2.60	1.60	1.25	.90	100.00	.....	45.00	3,676.50
	{ William Grandfield.....	.....	2.30	1.55	1.35	.90	100.00	.....	40.00	3,442.50
	{ Lawrence O'Brien.....	.....	2.60	1.10	.85	.80	90.00	.....	36.00	3,168.50

*Awarded the Contract.

STREET DEPARTMENT—Statement No. 4.

STREETS PAVED IN 1880.

Street.	Location.	Contractor.	Kind of pavement.	Length in Feet.	Number of Square Yards.	*Cost per Square Yard.	Total Cost.
Chapel.....	Union st. to R. R. Bridge....	C. W. Blakeslee & Son..	Belgian.....	32	128	\$1.14 }	.....
Union.....	Wooster st. to Court st.....	C. W. Blakeslee & Son..	Belgian.....	813	2,504.82	1.14 }	\$3,008.14
Wooster...	Union st. to R. R. Bridge....	C. W. Blakeslee & Son..	Belgian.....	36	121.6	1.14 }	.....
Water.....	East st. to Franklin st.....	G. Pohlman.....	Belgian.....	1,057	4,806.73	.....	.....

*Cost per square yard includes contract price, expense of inspector, &c.

STREET DEPARTMENT—Statement No. 5.

BIDS FOR STREET PAVING IN 1880.

STREET.	Location.	Kind of Pavement.	Bidders.	Bid per Square Yard.
Union.....	Wooster street to Court street,....	Belgian.....	{ G. Pohlman..... *C. W. Blakeslee & Son.....	\$1.10 1.03
Water.....	Bridge street to Franklin street,....	Belgian.....	{ C. W. Blakeslee & Son..... P. Dowling..... *G. Pohlman.....	1.27½ 1.19½ 1.14

* Awarded the Contract.

STREET DEPARTMENT—Statement No. 6.

SHOWING REPAIRS ON PAVEMENTS DURING 1880.

LOCATION.	Kind of Pavement.	Between what Points.	Work Done.	Cost.
Broadway.....	Telford & Belgian.	York and Howe.....	Top Dressed & Bel. Blocks.	\$2,718.16
Crown street.....	Telford.....	Temple to York.....	Top Dressed.....	273.25
Crown street.....	Wood.....	Church to Temple.....	Repairs.....	173.88
Chapel street.....	Telford.....	College to Park.....	Repairs.....	41.50
Church street.....	Telford.....	Chapel to Grove.....	Top Dressed.....	325.25
Court street.....	Telford.....	Olive to Union.....	Top Dressed.....	36.55
Dixwell avenue.....	Telford.....	Howe to Bristol.....	Top Dressed.....	745.35
Elm street.....	Telford.....	State to Church.....	Top Dressed.....	188.40
Elm street.....	Telford.....	College to York.....	Top Dressed.....	892.81
Grand street.....	Belgian.....	.....	Repairs.....	149.99
State street.....	Belgian.....	Grand to Court.....	Repairs, Gutters.....	105.51
State street.....	Telford.....	Grand to Humphrey.....	Repairs.....	1,080.10
St. John street.....	Telford.....	Artisan to East.....	Repairs.....	228.50
Temple street.....	Telford.....	.....	Repairs.....	50.00
Union street.....	Telford.....	Fair to Wooster.....	Repairs and Gutters.....	642.47
Wooster street.....	Telford.....	East to Union.....	Repairs.....	685.20
York street.....	Telford.....	Elm to Crown.....	Repairs.....	131.90

The above table includes expense of crushed stones, rolling, &c.

STREET DEPARTMENT—Statement No. 7.

SHOWING STREETS GRADED DURING 1880.

STREET.	Between what Points.	Contractor.	Cubic Yards.	Length in Feet.	Total Cost.
Blake.....	Whalley ave. to City line.....	C. W. Blakeslee.....	4,952	1,673	\$1,064.68
Blake.....	Whalley ave. to City line.....	C. W. Blakeslee.....			*2,046.15
Hudson.....	Goffe to Henry.....	T. Murphy.....	2,178	760	228.86
Hurlburt.....	Button to Lamberton.....	City.....		720	236.75
James.....	State to Railroad.....	P. Leonard.....	435	250	63.08
Laurel.....	East to Mill River.....	City.....		235	65.50
Lloyd.....	Chapel to River.....	City.....		275	115.80
Linden.....	Orange to Foster.....	City.....		690	375.87
Middletown av.....	Ferry st. to Quinapiac River.....	Michael Delaney.....	2,191	1,460	173.28
Norton.....	Whalley ave. to Goffe st.....	C. W. Blakeslee & Son.....		400	127.40
Percival.....	Sherman ave. to Winthrop ave.....	T. Murphy.....	750	520	60.00
Stevens.....	Davenport avenue to Sylvan ave.....	C. W. Blakeslee & Son.....	1,018	1,180	170.52
Sherman av.....	Percival to Goffe.....	T. Murphy.....	1,429	520	114.32
Wilson.....	Button to Lamberton.....	City.....		730	522.50
View.....		M. J. Stewart.....			74.87
Quinapiac Bridge.....	Approach.....	J. King.....			34.50
					\$5,474.08

*Including crushed stone, \$1,234.80.

STREET DEPARTMENT—Statement No. 8.

COMPARISON OF BIDS FOR STREET GRADING IN 1880.

LOCALITY.	Contractors.	Price per Yard.
Blake street.....Whalley avenue to City Line.....	{ Patrick Leonard.....	\$0.35
	{ John King.....	.27 ³ / ₄
	{ C. W. Blakeslee & Son*.....	.21 ¹ / ₂
James street.....State Street to R. R. Crossing.....	{ John King.....	.18 ³ / ₄
	{ Patrick Leonard*.....	.14 ¹ / ₂
	{ W. E. Davis.....	.20
	{ C. W. Blakeslee & Son.....	.17
	{ Richard Connor.....	.14
Middletown avenue.....Ferry street to Quinnipiac River.....	{ M. Badger.....	.11 ¹ / ₂
	{ Patrick Dowling.....	.10 ¹ / ₂
	{ John King.....	.09 ¹ / ₄
	{ Michael Delaney*.....	.08
	{ Patrick Leonard.....	.14 ¹ / ₂
	{ W. E. Davis.....	.14
	{ Dennis Ward.....	.13 ¹ / ₂
	{ C. W. Blakeslee & Son.....	.13 ¹ / ₂
Sherman avenue.....Percival street to Goffe street.....	{ John King.....	.09 ³ / ₄
Percival street.....Sherman avenue to Winthrop avenue.....	{ M. Badger.....	.09 ³ / ₄
Hudson street.....Goffe street to Henry street.....	{ James Boland.....	.09 ³ / ₄
	{ Thomas Murphy*.....	.09 ¹ / ₄
	{ W. E. Davis.....	.08
	{ Patrick Leonard.....	.40
Stevens street.....Davenport avenue to Sylvan avenue.....	{ C. W. Blakeslee & Son*.....	.24 ¹ / ₂
		.16 ³ / ₄

Total difference between highest and lowest Bids, \$1,469.80.

* Awarded the Contract.

STREET DEPARTMENT—Statement No. 9.

STREETS.	COST.
Adeline street.....	\$35.00
Chapel street, (East) shelling.....	580.15
Chapel street, (East) James to Lloyd.....	*389 20
Daggett street.....	12.00
Front street, (South) shelling.....	156.00
Front street, (North) shelling.....	12.00
Grand street, (East) shelling.....	610.35
George street.....	27.50
Houston street.....	19.25
Howard avenue, shells.....	26.95
James street.....	103.63
Kimberly avenue, shells.....	129.40
Lawrence street.....	45.00
Perkins street.....	3.00
Poplar street.....	54.55
State street, North of Neck Bridge.....	260.00
Sachem street.....	50.88
Thompson street.....	50.00
Third street, (Fair Haven).....	13.75
Washington street.....	99.60
	\$2,678.21

* Including crushed stone amounting to.....\$175.50

STREET DEPARTMENT—Statement No. 10.

SHOWING STREETS TURNPIKED BY LABORERS DURING 1880.

STREETS OR AVENUES.	COST.
Atwater street, ...	\$22.50
Alton street, ...	6.00
Asylum street, ...	15.00
Artisan street, ...	7 50
Adeline street, ...	49.50
Ashmun street, ...	43.50
Arch street, ...	12.00
Academy street, ...	7.50
Broad street, ...	18.00
Bradley street, ...	58.50
Beers street, ...	12.00
Broadway, ...	25.50
Button street, ...	12.00
Barnesville Bridge, ...	4.50
Blatchley avenue, ...	16.50
Bristol street, ...	18.00
Bishop street, ...	13.50
Brewery street, ...	4.50
Chapel street, ...	367.50
Chapel (East) street, ...	28.50
Congress avenue, ...	159.00
College street, ...	52.50
Columbus avenue, ...	102.00
Canal street, ...	22.50
Carlisle street, ...	22.50
Castle street, ...	6.00
Clark street, ...	4.50
Cottage street, ...	7.50
County street, ...	37.50
Center street, ...	7.50
Clay street, ...	9.00
Chestnut street, ...	7.50
Church street, ...	46.50
Cedar street, ...	33.00
Collis street, ...	34.50
Crown street, ...	58.50
Court street, ...	24.00
Cedar Hill avenue, ...	33.00

Kimberly avenue,	\$96.00
Kossuth street,	6.00
Lock street,	9.00
Lewis street,	4.50
Leonard street,	3.00
Lyon street,	40.50
Lloyd street,	63.00
Locust street,	24.00
Laurel street,	3.00
Lawrence street,	9.00
Lombard street,	27.00
Lamberton street,	16.50
Lafayette street,	43.50
Middletown avenue,	39.00
Miner street,	4.50
Martin street,	49.50
Market street,.	22.50
Main street,	6.00
Myrtle street,	3.00
Munson street,	33.00
Mansfield street,	18.00
Meadow street,	75.00
Nicoll street,	21.00
Nash street,	36.00
Oak street,	87.00
Orchard street,	85.50
Orange street,	111.00
Olive street,	28.50
Park street,	58.50
Prospect street,	123.00
Pearl street,	12.00
Pleasant street,	3.00
Pierpont street,	15.00
Prince street,	28.50
Poplar street,	16.50
Putnam street,	55.50
Portsea street,	40.50
Pine street,	40.50
Perkins street,	12.00
Quinnipiac bridge,	22.50
Rose court,	13.50
Rock street,	7.50
Rosette street,	13.50
Spring street,	33.00
Silver street,	15.00
State street,	247.50
Sperry street,	3.00
Sherman avenue,	58.50

Suburban street, ...	\$22.50
Summer street, ...	13.50
Sylvan avenue, ...	46.50
South street, ...	19.50
Saltonstall avenue, ...	7.50
Sachem street, ...	40.50
Shelton avenue, ...	72.00
St. John street, ...	9.00
Trumbull street, ...	46.50
Temple street, ...	75.00
University place, ...	10.50
Union street, ...	25.50
Union avenue, ...	18.00
Vernon street, ...	3.00
Whiting street, ...	9.00
Wall street, ...	42.00
Water street, ...	37.50
Winchester avenue, ...	85.50
Washington street, ...	118.50
Wallace street, ...	156.00
Wooster street, ...	82.50
Whalley avenue, ...	196.50
Wolcott street, ...	19.50
Warren street, ...	6.00
Ward street, ...	10.50
Walnut street, ...	9.00
Winter street, ...	13.50
Webster street, ...	4.50
Whitney avenue, ...	126.00
White street, ...	6.00
West street, ...	19.50
Wilson street, ...	12.00
William street, ...	12.00
Woolsey street, ...	28.50
York street, ...	70.50
Total, ...	\$6,991.50
Cleaning basins, ...	1,967.25
Cleaning crosswalks, paved streets, etc., ...	4,236.60
	\$13,195.35

STREET DEPARTMENT—Statement No. 11.

SHOWING WORK ON BRIDGES DURING 1880.

NAME.	Location.	Work Done.	Cost.
Barnesville.....	Mill River.....	Repairs.....	\$314.63
Chapel street.....	Mill River.....	Salary of Bridge Tender.....\$720.00 }	1,330.34
Chapel street.....	Mill River.....	Repairs..... 610.34* }	
Lewis street.....	Quinnipiac River.....	Repairs—Fences.....	117.11
Orange street.....	Mill River.....	Repairs.....	30.30
Quinnipiac.....	Quinnipiac River—Ferry street....	Salary of Bridge Tender.....\$399.96 }	512.38
Quinnipiac.....	Quinnipiac River.....	Repairs.....112.42 }	
Quinnipiac.....	Quinnipiac River—Grand street....	Repairs.....	180.77
Total.....			\$2,485.53

* Including Stone on Causeway, \$34.75.

STREET DEPARTMENT—Statement No. 12.

SHOWING COBBLE GUTTERS LAID DURING 1880.

STREET.	Between what Points.	Side.	Cost.
Goffe street.....	West of Orchard street.....	North.....	\$31.73
George street.....	Church and College streets, (Relay)....	North.....	193.19
Middletown avenue.....	Atwater street and Quinnipiac River....	Both	694.75
Washington street.....	Morris street and West River.....	South.....	176.44
Repairs.....	Various places.....	.....	364.74
Total.....	.....	.....	\$1,460.85

STREET DEPARTMENT—Statement No. 13.

SHOWING CROSSWALKS CONSTRUCTED DURING 1880.

STREET.	LOCATION.	SIDE.
Admiral.....	Across Dixwell ave.....	North.
Atwater.....	“ Grand st.....	West.
Canal.....	“ Lock st.....	“
“.....	“ Prospect st.....	“
“.....	“ Bristol st.....	“
East.....	“ Water st.....	“
Franklin.....	“ “.....	East.
Gilbert ave.....	“ Elliot st.....	South.
Hamilton.....	“ Water st.....	West.
“.....	“ “.....	East.
Henry.....	“ Dixwell ave.....	South.
Howard ave.....	“ Columbus ave.....	East.
“ “.....	“ Kimberly ave.....	West.
Hudson.....	“ Whalley ave.....	East.
Kimberly ave...	“ Lamberton st.....	“
“ “.....	“ First st.....	“
“ “.....	“ Greenwich ave.....	“
Norton.....	“ Whalley ave.....	“
Pine.....	“ Downing st.....	North.
“.....	“ Maltby st.....	“
“.....	“ Clinton ave.....	“
“.....	“ Lewis st.....	South.
Prince.....	“ Hill st.....	North.
Prospect.....	Near Whittlesey's.....	“
Sachem.....	Across Hillhouse ave.....	South.
Sherman ave...	“ Gilbert ave.....	East.
“ “.....	“ Maltby st.....	“
“ “.....	“ Fayette st.....	“
“ “.....	“ Oak st.....	“
Third.....	“ Houston st.....	South.
“.....	“ “.....	North.
“.....	“ Ferry st.....	South.
Union.....	“ Court st.....	East.
“.....	“ Wooster st.....	West.
“.....	“ Chapel st.....	“
Wolcott.....	“ Poplar st.....	North.
Whalley ave...	“ Winthrop ave.....	South.
“ “.....	“ Sherman ave.....	“
Wallace.....	“ Water st.....	East.
“.....	“ “.....	West.
Water.....	“ Hamilton st.....	South.
“.....	“ Wallace st.....	“
Wooster.....	“ Union st.....	North.
York.....	“ South st.....	East.

STREET DEPARTMENT—Statement No. 14.

SHOWING SIDEWALKS COMPLETED DURING 1880.

STREET.	Between what Points.	Side.	Material.
Canal.....	Prospect and Lock street.....	South.	Concrete.
Elm.....	College and York street ...	North.	relay.
Elliot lane.....	Wallace and East street.....	Both.	Concrete.
George.....	Dwight and Day street.....	Both.	relay.
George.....	Park & York & College & Church st	North.	relay.
Goffe.....	Webster and Foote street.....	North.	Brick.
Grand.....	Hamilton and Olive street.....	North.	Flag.
Grand.....	Olive and Jefferson street.....	South.	relay.
Grand.....	Olive and Artisan street.....	South.	Flag.
Gregory.....	Dixwell avenue and Ashmun street	North.	Concrete.
Hedge.....	Columbus avenue and Cemetery...	Both.	Curb.
High.....	Wall and Elm street.....	East.	relay.
Humphrey.....	Whitney avenue and Orange street.	Both.	Curb.
Howard avenue..	Congress and Columbus avenue....	East.	Brick.
Kimberly avenue	Howard ave. and Lamberton street.	East.	Concrete.
Kimberly avenue	Land of D L Daggett & Howard ave	East.	Brick.
Linden.....	Orange and Foster street.....	Both.	Curb.
Laurel.....	East and Mill River street.....	Both.	Curb.
Meadow.....	West Water st. and Union avenue	West.	Concrete.
Meadow.....	West Water st. and Union avenue	East.	Concrete.
Norton.....	Goffe street and Whalley avenue...	West.	Concrete.
Orange.....	Chapel st. & Nat. Tradesmens Bank	West.	Flag.
Poplar.....	Pine street and Shore Line R. R....	Both.	Curb.
Summer place...	Summer and terminus of Summer pl	East.	Concrete.
State.....	Court and Grand street.....	East.	relay.
State.....	Union avenue and Water street....	West.	Concrete.
Stevens.....	Sylvan and Davenport avenues....	East.	Brick.
Sherman avenue.	Chapel street and Winthrop avenue	East.	Flag.
Third.....	Houston and Ferry street.....	Both.	Curb.
View.....	State and Rock street.....	West.	Curb.
Wolcott.....	Blatchley avenue and James street.	North.	Curb.
Wilson.....	Lamberton and Rosette street.....	Both.	Curb.
Whalley avenue.	Winthrop avenue and County street	South.	Concrete.
Whalley avenue.	Winthrop avenue and Norton street	South.	Concrete.
Whitney avenue.	No. 13 and Audubon street.....	East.	relay.
Water.....	Union and Bridge street.....	North.	relay.
Washington.....	Morris street and West River.....	East.	Curb.
West Water.....	Hill and Lafayette street.....	North.	relay.

STREET DEPARTMENT—Statement No. 15.

SHOWING THE OPENINGS OF DRAW BRIDGES.

QUINNIPAC BRIDGE.						CHAPEL STREET BRIDGE.							
MONTH.	QUINNIPAC BRIDGE.					Tugs.	Barges.	Schooners.	Sloops.	Scows.	Propellers.	Miscs.	Total.
	Schooners.	Steamers.	Sloops.	Sharpies.	Total.								
Jan...	34	87	11	.....	132	61	19	4	.....	9	.....	.....	93
Feb...	27	68	4	9	108	102	48	11	.....	.....	.....	.....	161
Mar...	33	84	4	42	163	180	86	15	2	2	.....	.....	285
Apr...	44	138	15	141	338	204	63	22	18	18	7	.....	332
May...	50	107	32	145	334	207	81	24	13	15	.....	7	347
June...	15	116	136	102	369	130	41	21	11	7	.....	9	219
July...	14	182	272	125	593	142	46	22	12	1	.....	.....	223
Aug...	12	164	73	158	407	131	45	10	7	31	.....	.....	224
Sept...	12	124	91	266	493	122	57	19	6	9	.....	.....	213
Oct...	9	183	40	268	500	187	59	29	13	18	.....	.....	306
Nov...	25	168	16	158	367	149	53	22	11	.....	.....	.....	235
Total.	275	1,421	694	1,414	3,804	1,615	598	199	93	110	7	16	2,638

STREET DEPARTMENT—Statement No. 16.

SHOWING AMOUNT EXPENDED DURING 1880.

Bridges, ...	\$2,460.78
City Inspector's Department, ...	3,400.00
City Surveyor's Department, ...	6,073.31
Cleaning Sewers, ...	2,379.98
Cobbling Gutters, ...	1,460.85
Contingent Expenses, ...	1,575.83
Crosswalks, ...	3,762.76
Drainage, ...	4,126.75
General Repairs, ...	9,583.91
Grading Streets, ...	4,239.28
Mere Stones, ...	17.25
Opening and Widening Streets, ...	1,170.00
Ordinary Labor, ...	13,195.35
Paving Streets, ...	15,874.38
Public Parks and Trees, ...	5,461.09
Road Roller, ...	760.67
Stone Crusher, ...	8,439.91
Surveyor's Supplies, ...	165.70
Tools, Repairs, ...	533.25
Sewers, ...	16,496.28
Turnpiking Streets, ...	2,502.71
Walks and Curbs, ...	1,395.41
Wharfage, ...	183.00
	\$105,258.45



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For the Year 1881.

NEW HAVEN:

O. A. DORMAN, PRINTER AND MANUFACTURING STATIONER, 196 CHAPEL ST.

1882.



*Compliments of
C. E. Fowler,
City Engineer.*

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1882.

BOARD OF PUBLIC WORKS.

PRESIDENT.

JONATHAN W. POND.

Term expires Feb. 1, 1883.

Residence, 99 St. John Street.

JOEL F. GILBERT.

Term expires Feb. 1, 1883.

Residence, 413 Whalley Ave.

JOSEPH L. JOYCE.

Term expires Feb. 1, 1883.

Residence, 358 Whalley Ave.

LOUIS FELDMAN.

Term expires Feb. 1, 1883.

Residence, 164 Olive Street.

MICHAEL COLEMAN.

Term expires Feb. 1, 1884.

Residence, 58 Houston Street.

JOSEPH B. SARGENT.

Term expires Feb. 1, 1884.

Residence, 51 Elm Street.

CLERK.

FRED. H. WALDRON.

Regular Meetings of the Board Wednesday evening preceding first Thursday
in each month, Room 16, City Hall.

352.5
N45
1880/81

10193 Kaufman

REPORT

OF THE

BOARD OF ROAD COMMISSIONERS.

To the Honorable Court of Common Council :

Herewith please find the Annual Report of the Board of Public Works for the year ending Nov. 30, 1881.

This Board have received from your Honorable Body ninety-three orders, resolutions, etc., as follows :

56 for walks and curbs,	1 for cobble gutters,
10 for sewers,	5 for paving streets,
2 for grading streets,	5 for layouts of streets,
14 miscellaneous.	

In addition to these there have been presented to the Board forty-eight petitions for various matters.

Ten contracts were awarded for constructing sewers, three for paving streets, eight for furnishing sewer castings, blue stone, cobble stone, etc.

BRIDGES.

The bridge over the tracks of the Derby R. R., on the extension over West Portsea street, was completed in July last, one-half the expense being paid by the City.

Orders for bridges over the tracks of the Consolidated R. R. at DeWitt and Lamberton streets have been in the hands of this Board for some time, but could not be carried out for the want of an appropriation. Committees of

this Board have had conferences with the proper authorities of the railroad company to conclude arrangements for these bridges; thus far they have not arrived at definite conclusions.

Quinnipiac bridge has been opened 4,609 times during the past year for the following craft: Steamers, 1,797; schooners, 349; sloops, 627; sharpies, 1,833; miscellaneous, 3.

Chapel street draw has been opened 2,666 times for the following craft: Tugs, 1,576; barges, 746; schooners, 189; sloops, 82; scows, 73.

The freshets of last spring did considerable damage on the line of West River, washing away two bridges and considerable of the causeway at Oak street. The destruction of the bridge at Chapel street rendered a permanent structure necessary at this point. Measures were taken for carrying out this project, and in due time the Board received orders from your Honorable Body for straightening the river and the erection of a permanent iron bridge with stone abutments. This Board have had several conferences with the Selectmen of the Town of New Haven, and arrangements have been made for carrying out the improvements, the Town and the City paying each one-half of the expense.

PAVING STREETS.

New pavements have been completed on the roadway of Water street, from Franklin to Olive street, with Belgian blocks. This street is now paved from Bridge street to Olive. The necessity for this pavement is shown by the increased amount of travel through the street since its completion. The block between Olive and Union streets has not been paved with Belgian blocks, as there is no sewer yet constructed in that portion of the street.

A Telford pavement has been constructed in Crown street, from Temple to Church street, in place of the McGonigle wood pavement. With the completion of this pavement, the wood pavements which were laid in this

City have become obliterated and their service become a matter of history.

The first wood pavement was laid on Chapel street, from Church to York, in the fall of 1869. This was followed by the McGonigle wood pavement on Crown street in the spring of 1870. In 1871 the Brocklebank and Trainer wood pavement was laid on Union street, from Wooster to Court street. These have all been taken up and stone pavements substituted.

A Belgian block pavement has been completed during the past month, on Court street, from State to Orange street, and Belgian blocks have been placed between and two feet each side of the horse railroad track on Church street, from Chapel to George street.

This Board have orders for constructing a light Telford pavement on Howard avenue, from Congress to Kimberly avenue, and for covering the cobble pavement on Court street, from Orange to Church street, with asphalt or concrete. These orders will receive the attention of the Board as soon as the season will admit of the work.

This Board have taken occasion to recommend to your Honorable Body the necessity of properly sewerage and the constructing of light pavements on the principal thoroughfares leading into the City, believing such action in the interest of economy, and to meet the demands of public sentiment. The nature of the soil of most of the thoroughfares spoken of is such that it is almost impossible to keep them in proper repair and condition without paving, which should be done as fast as sewers are completed.

SEWERS.

Sewers have been completed in the following streets :

- Water street—East to Bridge.
- Eld street—State to Orange.
- Oak street—York to Spruce.
- Clark street—State to Orange.
- Norton street—Derby avenue to Chapel.
- Wall street—High street westerly.
- Library street—High street westerly.

The sewer in Spruce street has been relaid and sewers are now being completed in Vernon street, from Congress avenue to Davenport avenue, in Congress avenue, from Cedar to Vernon street, in the extension of Silver street to Howard avenue, and in Howard avenue, from Washington to Congress avenue.

The board have orders from your Honorable Body for sewers in the following streets : James Street, from Wolcott to Quinnipiac River; Edward street, from State to Nicoll; Hughes place, from Green to St. John street; Franklin street, from St. John to Grand; Grove street, from Church street to the railroad tracks, and for rebuilding the Grand street sewer.

There is quite a call for sewers at the present time, and the public are seeing the necessity for their construction. This Board believe that a liberal amount should be appropriated each year for this purpose, and the streets thickly settled and those requiring paving should receive immediate attention.

The length of sewers now in use in the city is $36\frac{5.03}{1000}$ miles, of which $1\frac{3.22}{1000}$ miles have been added during the past year.

PUBLIC PARKS.

In accordance with orders from your Honorable Body, a post and rail fence has been constructed around Monson Park, and the ground is being graded up.

Two new concrete walks have been constructed on Spireworth Square, and one on the old Green running from Court and Church streets to Temple and Chapel streets.

The layout of East Rock Park has been adopted by this Board, and was duly transmitted to your Honorable Body for approval. The roadway at the base of the rock, within the limits of this Park, between View and Orange streets, has been put in condition by this Board at an expense of \$177.24. Previous to doing this work the Park Commissioners requested the Board of Public Works to put this old highway in passable condition. This Board being un-

decided as to their powers and duties in the premises, requested of the Corporation Counsel his opinion on the matter, which he gave as follows :

“To the Honorable Board of Public Works :

“By your direction the Committee on Parks have requested my opinion ‘as to the rights, duties, and powers of the Board of Public Works in connection with the East Rock Park and its working.’

“It seems to be quite clear that as the law now stands the Board of Public Works have nothing to do with the ‘working’ of East Rock Park.

“That Board has certain powers and duties to perform in the process of obtaining lands for the purposes of said Park ; said powers and duties are set forth in detail in the sections of the charter referred to in the act providing for said Park. As soon as said lands become a part of said Park they pass under the jurisdiction of the East Rock Park Commission.

“That Commission has the exclusive control, management and superintendence of said Park.

“Public highways existing over or upon lands at the time such lands become a part of said Park are not affected and remain under the jurisdiction and control of the ordinary municipal authorities, except in the case of such existing highway the Board of Public Works have no ‘powers, rights or duties’ in connection with the custody, control or management of said Park. Said Board does not employ or direct officers or employees to care for or work upon said Park. The powers given by the charter to said Board of Public Works ‘to employ, etc. all officers and employees connected with the roads, bridges, sewers and parks of said city, etc.’ does not apply to or affect the provisions of law relating to the East Rock Park.

“Respectfully submitted,

“HENRY STODDARD,

“Corporation Counsel.”

October 1, 1881.

The amount expended upon the Parks during the past year is as follows:

Salary Superintendent,	\$1,149 99
Labor,	2,256.20
Carting, cutting grass, etc.,	773.89
Tools and repairs,	183.54
Fertilizers,	163.00
Oil, paint, etc.,	20.91
Repairs, seats,	28.69
Trees, repairs, fences, tree-boxes, etc.,	108.40

\$4,684.62

EAST ROCK PARK.

Grading roadway at base of Rock,	\$177.24	\$177.24
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WOOSTER SQUARE.

Repairs, walks,	\$356.46
New Granite post,	7.00
	\$363.46

SPIREWORTH SQUARE.

New concrete walks,	\$179.09
2,028 square feet turfing,	25.35
	\$204.44

MONSON PARK.

New fences,	\$340.00
Team work,	57.75
	\$397.75

OLD GREEN.

6,195 square feet turfing,	\$77.44
New concrete walk,	162.13
Repairs concrete walk,	18.39
Painting pump, etc.,	42.95
	\$300.91
	\$6,128.42

STONE CRUSHER.

There have been 6,741 cubic yards of stone crushed at the crushing works during the past year.

There are at the present time two of Blake's challenge crushing machines at the works, both in good order. There is also one Blake crusher, cast iron frame, at the works which is not in excellent order; and the Board are considering the matter of replacing this with one of more re-

cent pattern and improvements. Otherwise the machinery, buildings, bins, etc., are in good order.

LAYOUTS OF NEW STREETS, ETC.

Hearings of parties in interest, surveys and layouts of the following improvements have been adopted and transmitted to your Honorable Body :

For widening of Fair street, south side, from State to Union street.

For extending Lloyd street, southerly.

For extending Jackson street, northerly, to State street.

For taking the triangular piece of land, bounded by Kimberly avenue, Greenwich avenue and Lamberton street.

For the extension of Fillmore street, northerly, to Lombard street.

For new street (called Bright street), running from Grand to Pine street.

Hearings for extending Webster street and the discontinuance of old Canal street have been heard, but no decision has yet been reached.

The order for extending Veto street to Orange street was returned to your Honorable Body with the recommendation that an order be passed for widening Veto street, as that street was already laid out and extended to Orange street.

The order for straightening the channel of West River, between Martin Street and Derby avenue, has been duly considered, and measures taken to carry out the work at an early date.

MISCELLANEOUS.

In accordance with a vote of your Honorable Body, this department, early in the year, vacated room No. 9 City Hall, together with that portion of the adjoining vault on that floor, and accepted room No. 16, in conjunction with the Fire Commissioners, for the meetings of the two Boards.

Room 17, with the vault, was assigned to this Department, and is occupied by the Superintendent of Streets, the City Engineer, and Clerk of the Board, as offices. These rooms are much more convenient than

the one (No. 9), formerly occupied, and are admirably adapted to the wants of the Department, their only objection being their location, in the third story, makes them hard of access for parties doing business with the Department. This could, in a great measure, be obviated, by having an elevator placed in the building.

Respectfully submitted, in behalf of the Board,

FRED. H. WALDRON, *Clerk.*

REPORT
OF THE
CITY ENGINEER.

1881.

CITY ENGINEER DEPARTMENT.

City Engineer's Office : Room No. 17, City Hall.

Asst. Engineer's Office : Room No. 18, City Hall.

Draughting Room : Room No. 24, City Hall.

CITY ENGINEER.

CHARLES E. FOWLER, Residence, 374 Whalley Avenue.

ASSISTANT CITY ENGINEER.

ALBERT B. HILL, Residence, 176 York Street.

ASST. ENGINEER IN CHARGE OF SEWERAGE WORK.

CHARLES A. FERRY, Residence, 104 Liberty Street.

ASST. ENGINEER IN CHARGE OF STREET WORK.

CASSIUS W. KELLY, Residence, 105 Howe Street.

ASST. ENGINEER AND DRAUGHTSMAN.

* F. FLOYD WELD, Residence, 32 Gilbert Avenue.

† HENRY H. GLADING, Residence, 270 Martin Street.

SEWER INSPECTORS.

EDWARD DILLON, Residence, 237 Lombard Street.

THOMAS F. GRANDFIELD, Residence, 24 Gill Street.

BARTHOLOMEW HEALY, Residence, 36 Broad Street.

* Until July, 1881.

† From July, 1881.

REPORT
OF THE
CITY ENGINEER.

*To the Honorable Board of Public Works of the City of
New Haven :*

I have the honor to submit my thirteenth annual report of the work of the City Engineer Department during the year 1881, and of the Public Works of the City of New Haven.

SEWERS.

Sewers have been constructed during the year as follows : In Chapel street, at the corner of Norton street; in Clark street, from State street to Orange street; in Congress avenue, from Cedar street to Daggett street; in Eld street, from State street to Orange street; in Elm street, from Garden street to Kensington street; in Gilbert street, at the corner of Howard avenue; in Howard avenue from the New Haven and Derby R. R. crossing to Congress avenue; in Library street, from High street westerly; in Norton street, from Derby avenue to Chapel street; in Oak street, from York street to Spruce street; through lands of R. M. Burwell and others, from Cedar street to Howard avenue; in Spruce street, from Oak street to George street; in Vernon street, from Congress avenue to Davenport avenue; in Wall street, from High street westerly; in Washington street, at the corner of Howard avenue; and in Water street,

from East street to Bridge street—in all sixteen streets or parts of streets.

The lengths and sizes laid are as follows :

30-inch Brick Sewer, ...	682 $\frac{6}{10}$ feet.
24 “ “ 	2265 $\frac{5}{10}$ “
15-inch Pipe Sewer, ...	2953 $\frac{7}{10}$ “
12 “ “ 	1605 $\frac{6}{10}$ “

Making a total of 7507 $\frac{4}{10}$ feet, or 1 $\frac{4\frac{2}{10}2\frac{2}{10}}{10000}$ miles.

In the rebuilding of the sewer in Spruce street, a portion of the old sewer was taken up and discontinued, the lengths and sizes being as follows :

15-inch Pipe Sewer, ...	378 $\frac{5}{10}$ feet.
12 “ “ 	148 “

A total of 526 $\frac{5}{10}$ feet, or 0 $\frac{1}{10}$ mile, leaving a net gain for the year of 6980 $\frac{9}{10}$ feet, or 1 $\frac{3\frac{2}{10}2\frac{2}{10}}{10000}$ miles.

Total length of Sewers, Jan. 1, 1881, ...	35 $\frac{181}{10000}$ miles.
Added during the year 1881, ...	1 $\frac{3\frac{2}{10}2\frac{2}{10}}{10000}$ “
Total length of Sewers, Jan. 1, 1882, ...	36 $\frac{503}{10000}$ “

The details of the sewer work of the year are given in Statements Nos. 1, 2 and 3.

CLEANING OF SEWERS.

The construction of sewers under the system designed for the City of New Haven, by E. S. Chesbrough, C. E., of Chicago, was commenced in the year 1871.

The total length of sewers then in use was about nine miles, and most of them were utilized in the new system. To do this, however, it became necessary to rebuild certain sewers, or parts of sewers, and to construct proper curves and connections at other points. These connections were completed as soon as practicable, after which a thorough and systematic inspection was made of the condition of the old sewers. Previous to the year 1871 but very little attention had been given to the cleaning of sewers, and it

was found in this examination that some of them were badly filled with sand and filth. A force was organized and set at work cleaning and flushing all the sewers that needed attention, and continued until the entire system was placed in fair condition. At first the arrangements for cleaning were of the simplest kind. Men entered the larger sewers and removed the accumulations of sand, etc., by using small buckets which were filled and carried to the nearest man-hole, and there raised to the surface of the street. This was a slow and tedious process, and a very expensive one. Accumulations in the pipe sewers were removed, as far as possible, by flushing with a hose from a fire hydrant. The first improvement was in the use of a sewer cleaning truck, so constructed that it would run in any sewer that could be entered by men for cleaning. This truck, the invention of Assistant City Engineer Albert B. Hill, Assistant Engineer William S. McHarg and Sewer Inspector Bernard Carlin, consists of a light iron frame running on adjustable wheels, and carrying two iron buckets for the removal of material, and with its use *two* men are able to do as much work in one day as they could in from five to eight days under the old plan. It is with this machine that the brick sewers of two feet diameter and upwards are cleaned at the present time.

For flushing the pipe sewers, a large Monitor water cart was procured, the tank holding seven hundred gallons, and provided with a valve opening and canvas hose sixteen inches in diameter. The cart, filled with water from a neighboring hydrant, was driven over a man-hole, and through the canvas hose, the water dropped into the sewer, the time occupied in emptying the tank being from six to eight seconds. This plan was much more effective than the flushing by a hose, but a serious objection was that the sudden dropping of the large quantity of water into the sewer and man-holes, caused injury to them. In cases where the sediment or filling in the sewers had become firmly packed, it took considerable time to get it all washed out. As an experiment, I had round wooden balls made, two inches less in diameter than the sewer, and

these were forced through the sewer, with water from the tank. The results obtained were very satisfactory, and the time and expense were largely reduced. The wooden ball would be driven along the sewer by the force of the water until an obstruction was met, when the ball immediately became a dam, and the water escaping under and around the ball, rapidly loosened up the material and washed it along the sewer, followed by the ball. When the ball had passed through a sewer, it was then known that the sewer was substantially clean, and a few loads of water after that would remove any sediment that might be left.

To protect the sewers and man-holes from injury, a galvanized iron pipe was provided, the top being enlarged in the form of a funnel to receive the end of the canvas hose, and the bottom curved so as to be placed into the end of the sewer at the bottom of the man-hole. This pipe was made in two sections, the lower section being eleven inches in diameter, and the upper one, below the funnel, ten inches, so as to slide into the lower section and accommodate itself to man-holes of different depths, the top of the funnel being on a level with the top of the man-hole. In using the round wooden balls, a few cases occurred where delays were caused by the ball encountering a solid substance, such as a loose brick, and becoming wedged or stuck in the sewer. Then it became necessary to enter the sewer at the next man-hole below the obstructed ball, and by the use of extension rods, push the ball back to the man-hole above. To obviate this difficulty, it was deemed advisable to have a stout cord fastened to the ball, so that in case an obstruction was met which the ball and water would not remove, the ball could be pulled back, and the obstruction removed by other means. It was found that with a cord attached, the round ball was not the best form, owing to the liability of its rolling over, so a wooden cylinder was substituted, the diameter being two inches less than that of the sewer, and its length about fifty per cent. more than the diameter. The ends were turned off so that the block would not catch on projecting joints, and a bolt or rod through the center, with a ring at the back end, furnished

a place for attaching the cord. Such is the form of the ball or cylinder in use at the present time, and in appearance is somewhat similar to that of an ordnance shell.

The apparatus for flushing comprises, in addition to the articles described, several sections of hose, reeled and carried on a two-wheeled carriage, a reel for the cord, iron buckets, and a light derrick for removing at the man-holes the sand and other material washed from the sewers, a set of extension rods, and a plunger for removing substances such as bricks, stones, tree roots, etc., that are sometimes found in the sewers, and cannot be forced out with water, and a proper supply of picks, shovels, rope ladders, bars, lanterns, etc.

The mode of operation, at the present time, is as follows : The man-hole at the upper end of the sewer is opened, the wooden ball placed in the end of the sewer, the galvanized iron pipe placed in position, the cord passed through the pipe and attached to the ball, the water cart set over the man-hole, and the canvas hose dropped into the funnel of the iron pipe, the hose laid from the nearest hydrant to the tank of the water cart, and the water turned on. When the tank is full, the valve is opened instantly by a powerful lever, and the water passing through the canvas hose and iron pipe into the sewer, forces the wooden ball along. The water not being turned off at the hydrant continues running, and in from three to four minutes, the tank is filled and the water dropped into the sewer, as before. The large quantities of water, following each other in rapid succession, and before the effect of the preceding discharge is fully lost, is a force that is almost irresistible, and the result is, the ball is driven rapidly along the sewer, carrying all deposit before it. When the ball has reached a lower man-hole, generally the second or third one below the one where the water is admitted, the flushing apparatus is moved down to that man-hole, and the operation is repeated, and so on, to the end of the sewer. A change of ball is made at the man-hole where a change in the size of the sewer occurs. The deposit washed from the sewer is raised

to the surface of the street at the man-holes and carted away.

Since the introduction of ball flushing, the cost of sewer cleaning has been as follows :

1879, Average cost per mile of sewer,		\$70.15
1880, " " " " " "		69.72
1881, " " " " " "		57.42

This is for all the sewers, as the expense of keeping the large and small sewers clean has not been kept separate.

The successful operation of our system of flushing and cleaning, is due very largely to the care and attention given to the work by Mr. Edward Dillon, Superintendent of Sewers, and some of the best features of our present plan are the result of his suggestion.

SEWER REPAIRS.

But little work was required during the year in repairs to sewers and appurtenances. A few of the old basins were rebuilt, and some new ones added. All work in this line is done by the sewer inspectors when not engaged upon the construction of sewers.

SEWER CONNECTIONS.

Every connection made with the sewers has been done under the supervision of some one from this department, —whose duty it has been to see the first pipe laid, and the connection properly made,—also to get the measurement of where the pipe is to be laid to the land or property to be drained. Sewer connections, as made, are plotted on the sewer maps, and are of great value for future reference. To the present time, the laying of the connection beyond the first pipe has been done without inspection on the part of the city. The number of sewer connections made and inspected during the year was 287,—not including repairs and changes.

STREET PAVEMENTS.

Under orders from the Court of Common Council, the Telford pavement between the rails, and for a width of two feet on each side, of the horse railroad tracks on Church street, from George street to Chapel street, was removed, and a Belgian pavement laid there instead. At the same time the wood pavement on Crown street, from Church street to Temple street, was removed, and the block laid with a Telford pavement. The Telford pavement removed from Church street, was used in the construction of the pavement on Crown street, and the filling for Church street was taken from Crown street. Both pavements were laid under one contract.

New pavements of Belgian blocks were laid on Court street, from State street to Orange street, and on Water street, from Bridge street to East street, and from Franklin street to Olive street.

The total length of streets paved during the year, not including the work done on Church street, is 2865 feet, or $0\frac{543}{1000}$ miles. The length of street pavement discontinued on Crown street is 348 feet, or $0\frac{66}{1000}$ miles, leaving the net gain in length for the year to be 2517 feet, or $0\frac{477}{1000}$ miles.

Total length of paved streets, Jan. 1, 1881,	13 $\frac{476}{1000}$ miles.
Added during the year 1881,	$0\frac{477}{1000}$ "
Total length of paved streets, Jan. 1, 1882,	13 $\frac{953}{1000}$ "

The total length of the different kinds of street pavements in use at the present time is as follows:

Telford Pavement,	10 $\frac{194}{1000}$ miles.
Belgian " "	$3\frac{290}{1000}$ "
Concrete " "	$0\frac{308}{1000}$ "
Cobble " "	$0\frac{161}{1000}$ "
Total,	13 $\frac{953}{1000}$ "

The details of the work on street pavements during the year are given in Statements Nos. 4 and 5.

STREET GRADING.

But little work was done in the grading of streets, other than that done by the Superintendent of Streets. Two contracts only were awarded—one for filling a large washout on Chapel street, near West River, and the other for filling and grading the streets around the new school house on Ferry street.

The details of street grading for the year are given in Statement No. 7.

EXCAVATIONS IN STREETS.

The ordinances of the City provide that the Board of Public Works shall direct licenses to be issued to such persons as said Board shall deem competent, to make necessary connections with gas mains, water mains, and public sewers; and, in accordance with that provision, the persons engaged in that business have been duly licensed. Licensed parties can at any time, upon payment of the proper fee, procure a permit of the Superintendent of Streets to make excavations in the streets for the purpose of making connections or repairs. The ordinances of the City require that it shall be the duty of such persons making such excavations, to perform the work and place the excavated material so that it will cause the least possible inconvenience to the public—to fill the excavation so that it shall not settle—to restore the street and pavement in as good condition, in all respects, as it was before the excavation was made, and to properly protect the public from injury while the work is being done. Each licensed party is also under bonds to the City of New Haven, for the faithful performance of the work and compliance with the ordinances of the city, and conditioned to save the City harmless from all suits or actions for damages or injuries received or sustained, by any person or persons, during the progress of the work, or on account of negligence to properly guard the same.

It is expected that the work in all cases shall be done in the very best manner, and the street shall be left in good

condition, but it very often happens that such is not the case. There are some of the licensed parties who do their work in a first-class manner, and try to comply with every requirement, but there are others who do not, and I have had occasion to complain of parties, upon several occasions, more particularly in relation to the laying of sewer connections, and the manner of leaving the street. A person licensed by the Board to lay sewer connections is naturally supposed to be *competent* to do the work in a proper manner—in fact his license is, to a certain extent, a guarantee that he *is* competent, and the public so accept it. I am fully of the opinion that only those who thoroughly understand the work, and personally superintend it, should be licensed to lay sewer connections, and in the granting or renewal of licenses, hereafter, the competency of the applicant should be carefully considered. There has been so much miserable work done—and it is coming to light more and more every year—that there seems to be a demand for more care in granting licenses and more thorough supervision of the work.

BRIDGES.

The new accessions to the territorial limits of the City and Town have increased also the extent of bridging to be cared for. A brief review of the character and condition of the bridges over which the City has jurisdiction, wholly or in part, and the extent of such jurisdiction, is therefore appended.

BRIDGES OVER THE QUINNIPIAC RIVER.

The Tomlinson Bridge, near the steamboat wharf, is a very dilapidated wooden structure and a toll bridge. Either of those conditions should be sufficient to condemn it on an important approach to a City of the size and intelligence of New Haven ; but the combination of the two is a positive disgrace, unless regarded from the antiquarian point of view, as an interesting relic of ancient forms and customs.

The structure was built by "The Company for erecting and supporting a toll bridge from New Haven to East Haven," incorporated by special act of the General Assembly, October 1796. The company were authorized to purchase and hold lands, not exceeding 100 acres, which was declared to be personal estate, and divided into 60 shares. They were to collect tolls for their own use and benefit for a term of 70 years from the date fixed for its completion. The bridge was to be completed within two years from the rising of the General Assembly, in May, 1797. It was to be not less than 27 feet wide, with a draw of at least 26 feet wide, and at least one half of the bridge was to be built solid.

The proprietors of the common and undivided lands made certain grants of land to the bridge company, conditioned upon the company's keeping the bridge in good repair, as indicated by the following extracts from the records:

"At a proprietor's meeting, legally warned and holden in East Haven, on the 16th day of February, 1797" * *
 * "upon the petition of Capt. Enos Hemmingway and Capt. Stephen Woodward, for themselves and the rest of the proprietors of the proposed tole bridge about to be built across the harbour that divides the Towns of New Haven and East Haven, this meeting doth grant to said Hemmingway and Woodward, and the rest of the proprietors of said bridge, the Flats one hundred and eighty-seven feet in width from the landing where the feary known by the name of the loer feary where said feary has lately Been Kept Running westward to the channel, on which the said Bridge of 27 feet in wedth is to be Built on the Center, and the Remainder, exclusive of what said Bridge shall cover, shall be to said proprietors and to their Heirs and Assigns for their own use for to build wharves, Bridges, stores or any Buildings thereon so long as said Bridge shall be Built and Kept in good repair." (East Haven Town Records, Vol. 1, page 367.)

A similar grant was made on the New Haven side. In May, 1797, "some dispute having arisen whether said grantees could hold said grant by reason of their not com-

plying with ye conditions upon which said grant was made, or whether ye proprietors could not reclaim ye same, in order that ye whole business should be settled," the committee of the proprietors of the common and undivided lands of the town and county of New Haven quit claimed to the bridge company the flats, 80 feet wide, running from the Ferry point to the channel, and another strip 70 feet wide adjoining the first and of the same length, "which in opinion will be needful to accommodate said bridge," * * * "to have and to hold ye premises with ye privileges thereof, for ye purpose of building said bridge so long as said bridge shall be kept up and in repair for public use. * * Ye proprietors aforesaid shall be barred therefrom unless said bridge shall cease to be used for ye purpose aforesaid." (New Haven Records, Vol. 47, page 343.)

In May, 1799, it was represented to the General Assembly "that the bridge hath cost a much larger sum than was expected, that the toll at present established doth not yield to the company but about four and a half per cent. per annum on the capital sum advanced," and a resolve increasing the toll was passed.

In 1805 the toll was still further increased, and the time that the company and their successors were authorized to use and occupy said bridge was extended to 150 years from the completion of the same—*i. e.*, until 1949. Hence, the bridge company are required to keep it in good repair, subject to the inspection of the General Assembly, for 68 years longer.

The old draw of 26 feet opening, next to the steamboat dock, was inadequate to accommodate the navigation of the river, and as the bridge company refused, or neglected to provide more ample accommodations, the interposition of the General Assembly was invoked, which, in 1842, ordered a new and larger draw span to be made easterly of the old one.

In 1867 a resolution was passed empowering the bridge company to dispose of the bridge and appurtenant lands, and empowering the towns to purchase and make it a free bridge. But the company were required to keep the

bridge in good repair until the towns should assume the care and management.

In 1872 a resolution was passed granting permission to parties who might purchase the bridge to move the draw further east, provided that the same be done with the consent and approval of the majority of the Bridge Commissioners of said bridge, and providing that the opening in the draw should not be less than 70 feet.

Commencing at the face of the City abutment, the spans in the clear and the widths of the piers are as follows : Fixed span 30 feet, pier 40 feet, draw span 55 feet, pier 35 feet, fixed span 75 feet, pier 38 feet, fixed span 60 feet, pier 31 feet, fixed span 60 feet, to face of easterly abutment or beginning of causeway. The piers occupy about one-third of the space between the abutments. The width of the roadway on the draw span is 12 feet, on the fixed spans 17 feet, with 3 feet sidewalk ; on the causeway 20 feet, with 3 feet sidewalk. The draw span is of the cantilever type, each half mounted on trucks and running back on the fixed spans. The trusses of the fixed spans on the town side are practically abandoned, the roadway being carried on piles driven in the stream between the piers. These piles with which the fixed spans are thickly studded, and the immense stone piers (four times as wide as necessary if of first class masonry on a good foundation) are a serious detriment to the upper harbor. The contraction of the water way causes the current to run very swiftly through the remaining portion, increasing the difficulty and danger of passing through the draw, and in other ways injuring the harbor by interfering with the natural action of the tides. The entire present structure should be removed, and a new iron bridge substituted, consisting of a fixed span at either end and a swing bridge in the middle, and it should be a free highway for the use of the public forever. As to how this should be accomplished, the opinions of interested parties will differ.

The New Quinnipiac Bridge is one-half within the limits of the City. It is a substantial iron structure, and consists of a fixed span at each end of 117 feet in the clear,

and a two-span pivot draw, 202 feet long, with two channel openings of 79 feet clear. The swing bridge is center bearing on a ten inch pin. The roadway is twenty-two feet wide in the clear between wheel guards, and the sidewalks $4\frac{1}{2}$ feet. The trusses are of the double intersection Warren girder type with riveted connections. They are 12 feet deep on the fixed spans and on the draw span 12 feet deep at the ends and 16 feet deep at the center. No overhead bracing was permitted. The bridge is particularly noticeable for its very solid, rigid roadway. The floor-beams are solid plate girders 30 inches deep. The stringers are of iron 15 inches deep. The roadway covering consists of 5 inch creosoted timber on which is laid a 4 inch wood pavement, covered with about an inch of coal tar concrete. The piers and abutments are of Stony Creek granite, built in caissons, in excavations carried down to the rock. The bridge was designed by Clemens Herschell, C. E., and proportioned to carry a uniformly distributed load of 100 lbs. per square foot on roadway and sidewalk, or a concentrated load of 20,000 lbs. on two wheels six feet apart, placed anywhere on the roadway. The iron work has recently been painted, and the whole structure is in good condition.

The contractor for the piers and abutments was paid, ...	\$67,097.14
The contractor for the iron work, ...	49,239.08
The total cost of the structure, not including the approaches, was	131,296.14
The cost of the East Haven approach, ...	12,306.98

The cost of the completed structure to the City was as follows :

One half of the bridge proper, ...	65,648.07
Cost of City approach, ...	17,817.90
Cost to City of land damages, ...	12,653.00
Total cost to City of New Haven, ...	<u>\$96,118.97</u>

The Grand Street, or Dragon Bridge, is 425 feet long, 290 feet of which belongs to the City. The spans are eight in number, of about 50 feet each in the clear. The roadway is 35 feet wide, and the sidewalks $7\frac{1}{2}$ feet. The compression members of the four under-grade trusses,

of five panels each, are of cast iron—an objectionable material for the principal members of any bridge. The floor beams are of wood and are badly decayed. They should be replaced with 12-inch wrought iron rolled beams, weight, 42 pounds per foot. A large proportion of the stringers will also need replacing during the coming summer, and they should be 4 x 12 inches.

The Lewis Bridge is seven-twelfths in the City and five-twelfths now in the Town of New Haven. It was built during 1878-9 from plans prepared in this office. It is in one span of 150 feet, from center to center of end pins, and 18 feet clear roadway. The two trusses are of wrought iron throughout, of the double intersection type, with inclined end posts. The trusses are 24 feet deep, and the number of panels eleven. The posts are both pin and riveted connection, and the diagonals pin connection. The end posts are pin bearing at the bottom. The floor beams are solid plate girders, 26 inches deep at the center, and riveted to the posts above the lower chord. The stringers are 4 x 12 inches, spaced 2 feet on centers, and the planking 3-inch Southern pine. The bridge is designed to carry with safety a uniformly distributed load of 80 lbs. per square foot of roadway, or a concentrated load of 20,000 lbs. on four wheels, six feet apart transversely and seven feet apart longitudinally.

The cost was as follows :

	City New of Haven.	Town of East Haven.
Superstructure complete,	\$2,196.20	\$1,579.54
Abutments and foundations,	623.00	623.00
Approaches,	1,387.40	1,684.64
	\$4,206.60	\$3,887.18

Bridges on Mill River.—These are entirely under the jurisdiction of the City.

The Chapel Street Bridge consists of two fixed spans on the westerly end, of about 41 feet in the clear, a two-span pivot draw 154 feet over all, with channel openings of about 53 feet clear. The roadway is 18 feet wide, and the sidewalks on each side, 5 feet. The trusses are of wrought iron,

of the lattice type, with vertical 6-inch I beam posts, and with double intersections on the draw span, and single intersections on the fixed spans. The floor beams are 9-inch, light rolled beams, attached at every fourth panel point, consequently on the draw span nearly two-thirds of the web system is waste metal, so far as contributing to the carrying capacity is concerned. The floor beams are attached to the bottom chord by straps secured by rivets in tension—an objectionable form of attachment when it can be avoided, for it is somewhat uncertain how much dependence can be placed on rivets in tension, the rivets being driven hot the shrinkage on cooling develops an initial stress so that when struck a smart blow with a hammer the head will sometimes fly off.

The ends of the draw are supported by rods passing over a gallows frame, a necessary evil in this particular case, but dispensed with in the more modern designs for draw-bridges.

The turn-table and masonry are in good condition at present, but the superstructure is decidedly lacking in rigidity, due chiefly to the flexible floor system, and the unsupported ends of the draw.

The traffic over the bridge is large and constantly increasing, and to adapt it to the needs of the locality some radical changes are needed. It is somewhat like putting new cloth on an old garment, and a pretty poor one at that, but if treated to a rigid floor system, and firm supports for the ends of the draw, the improvement in the bridge would be very marked. Still better, when the expense is warrantable, will be the substitution of stone arches for the fixed spans, and a new swing bridge for the present one, designed in accordance with the modern improvements in such structures.

Barnesville, or Grand Street Bridge, is a pile and timber structure, about 60 feet wide. The easterly span is about 60 feet and the westerly about 50 feet. Both masonry and superstructure of the easterly span need reconstructing. The westerly span is in better condition. Plans for a new stone bridge and also for an iron structure have been prepared.

Neck Bridge and *Orange Street Bridge* are both pile and timber structures. The former is 84 feet between abutments and 45 feet wide. The latter is 400 feet long with 16 feet roadway. They are both in good condition.

BRIDGES ON WEST RIVER.

These bridges are now one-half within the City limits, excepting the easterly bridge at Kimberly Avenue, which is now entirely within the City's jurisdiction.

Kimberly Avenue and *Washington Street Bridges* are pile and timber structures, both in good condition. The former is 90 feet between abutments and 27 feet wide. The latter is 180 feet between abutments, with $27\frac{1}{2}$ feet roadway.

The Congress Avenue Bridge is of iron, built in 1876, the City building the easterly abutment and approach, the town of Orange the westerly abutment, and the towns of New Haven and Orange jointly the superstructure. The bridge is 100 feet span from center to center of end pins, with 40 feet clear roadway, and one 6-foot sidewalk. It is proportioned to carry the other sidewalk when the same shall be needed. The trusses have seven panels 14 feet 3 inches square, with pin connections and inclined end posts. The latter are pin bearing at the bottom. There is no overhead bracing. The floor beams are lattice girders 3 feet deep. The stringers for the roadway are 5x14 inches southern pine, spaced two feet on centers; and the planking three inches southern pine. The capacity of the bridge is 80 lbs. per square foot of roadway and sidewalks. For a detailed description of this bridge, reference is made to my report for 1876.

The Oak Street Bridge is a somewhat dilapidated pile and timber structure 85 feet between abutments, and 14 feet roadway. Not much material should be wasted on repairs to the old structure, but a new bridge should be built on the direct extension of Oak street, regard being had to the future straightening of the river.

The Derby Avenue Bridge is owned by the Derby Turnpike Company. Attention was repeatedly called to the

dangerous condition of this structure in my previous reports. Anxiety in regard to it, however, was removed by the removal of the bridge during a heavy freshet last spring. It has been patched and partially rebuilt, and will answer for a bridge until another severe freshet.

The Martin Street Bridge is of iron, of the bowstring type, built by the King Bridge Company. It is 100 feet span with 20 feet roadway, and one 6-foot sidewalk. The traffic over it is very light, and the bridge is in good condition.

The Whalley Avenue Bridge is 100 feet span with 50 feet roadway and two 6-foot sidewalks. The six iron trusses are under-grade. Their depth is only one-twentieth of the span, therefore they are very heavy and very flexible. The flexibility may be diminished a little by a judicious adjustment of ties and counters. But the defects are so inherent that little can be done for the bridge until the constant and severe vibrations to which it is subject shall have worn it out.

COST OF REPAIRS ON ROADWAYS OF BRIDGES.

The following table exhibits the average cost per square foot, per annum, of keeping up and in repair the wooden roadways of the bridges within the limits of the City, from Jan. 1st, 1872, to Jan. 1st, 1882:

BRIDGES.	Average Cost per Square Foot Per Annum for 10 Years.
Barnesville, ...	11.2 cents.
Neck, ...	9.6 "
Kimberly Ave., ...	8.5 "
Chapel Street (Mill River), ...	6.3 "
Grand Street (Quinnipiac River), ...	5.5 "
Orange Street, ...	2.9 "
Congress Avenue, ...	2.2 "

The general average per square foot is $6\frac{2}{10}$ cents per annum.

A *light, smooth, durable, and cheap* roadway covering for bridges is a desideratum.

Comparative estimates for a city bridge, with the most

economical proportions in each case, show that for a permanent roadway of iron stringers, creosoted, tongued, and grooved timber, covered with a light asphalt pavement for a wearing surface, the interest at 5 per cent. on the extra cost of such a roadway, would be less than the average annual cost of the temporary roadways above given. The cost of keeping in repair would be very light, and would be overbalanced by the diminished risk of accidents, the increased comfort of the traveling public, and the lengthened life of the bridge.

RAILROAD BRIDGES.

The bridges over the railroads are owned and maintained by the different railroad companies. Most of them are wooden structures, and some of them should be replaced at an early date with a better material.

The trusses of the bridge over the railroads, at the junction of Grand and St. John streets, are a great obstruction to public travel, and it is to be hoped that when the bridge is rebuilt they will be removed.

The obstruction in the street, at the corner of Prospect and Trumbull streets, of the wing wall of the bridge, still remains, the railroad company having entirely disregarded the orders of the Court of Common Council in reference to its removal.

WALKS AND CURBS.

In compliance with orders from the Board, and requests of property owners, lines and grades for sidewalk work have been given wherever necessary. The total length given during the year amounts to $5\frac{1}{8}$ miles.

BATH HOUSES.

A floating bath house has been constructed and attached to the bath house at West Bridge. It is located in deep water, where it can be used at all stages of the tide. The entrance to it is through the old bath house nearer the

shore. The size of the tank is 20x30 feet, and 5 feet in depth. The float is composed of four lines of 10x12 inch spruce timber, securely braced and fastened together, and to the tank. A fence, seven feet in height, is constructed around the outside of the float. A movable platform and gangway connects the two bath houses, and from the float, which forms the platform, suitable stairs lead down into the tank. The total cost of the floating bath house was \$447.00, the work being done under a contract with the Board of Public Works.

The management and control of the bath houses rests with the Committee on Bath Houses of the Court of Common Council, although, during the year, I have had charge of the repairs to the buildings under the directions of the City Auditor.

SURVEYS AND MAPS.

Considerable work was called for during the year on surveys and maps for proposed improvements and for assessments of benefits and damages.

For the Board of Public Works, maps were prepared for the widening of Fair street, between Union street and State street, for the extension of Webster street to Winchester avenue, for the extension of Silver street to Howard avenue, for the extension of Lloyd street to the Quinipiac River, for the extension of Jackson street to State street, for the extension or widening of Veto street, and for the taking of the triangular piece of land bounded by Kimberly avenue, Greenwich avenue, and Lamberton street.

For the Board of Compensation for assessing damages and benefits for the opening and widening of streets, maps have been prepared for Fair street, Lloyd street and Jackson street, as above, with such additional territory as the Board required. A very large amount of work done for this Board will be referred to under the head of East Rock Park.

For the Board of Compensation for assessing benefits for sewers and pavements, maps have been prepared of Court

street, between State street and Orange street, College street, between Wall street and Grove street, Elm street, between Garden street and Kensington street, Lafayette street, between Silver street and Prince street, Lyon street, between Jefferson street and Bradley street, State street, between East street and Mill River street, Union street, between Chapel street and Court street, Water street, between East street and Bridge street, William street, between Franklin street and Olive street, and Whalley avenue, between Winthrop avenue and Norton street, and also between County street and Garden street.

For the Committee on Building Lines, maps were prepared for Greenwich avenue, Howard avenue, Kimberly avenue, Lamberton street, Ward street and Wolcott street.

In all cases the names of the owners of the lands affected are furnished, and the titles to the same verified by a careful search of the land records. Some idea may be formed of the large amount of labor required in this work from the number of owners to the different tracts of land furnished to the various Boards and Committees, as shown by the following statement :

For Board of Public Works, number of owners and number of notices for hearings, prepared and served, ...	44
For the Board of Compensation for the opening and widening of streets, number of owners furnished, ...	1,088
For Board of Compensation for assessing sewers and pavements, number of owners, and number of notices for hearings prepared, ...	154
For Committee on Building Lines, number of owners furnished, ...	223
Total, ...	1,509

There may also be mentioned the fact that during the year there was prepared for the tenth census of the United States, a map of the City, showing the entire sewerage system, contours or lines of equal elevation over the whole area, and the sizes and material of all sewers constructed and to be constructed.

Preliminary surveys and estimates have been made of the proposed straightening of the channel of West River, between Derby avenue and Martin street, this work being done under a special arrangement between the Board of

Public Works and the Board of Selectmen of the Town of New Haven.

Miscellaneous work under this head consisted of maps, profiles, sketches, plans, etc., for various purposes, and required by the different Boards and Committees of the Court of Common Council.

NUMBERING STREETS.

In accordance with orders of the Board of Aldermen the following streets were numbered or re-numbered, viz. : Adeline, Ann, Argyle, Ash, Bassett, Blake, Brewster, Burns, Canner, Cave, Cedar Hill avenue, Chambers, Cherry Ann, Christopher, Davenport avenue, Derby avenue, Dixwell avenue, Dummer, East, Elm, Everitt, Gibbs, Grace, Grant, Haven, Hobart, Hurlbut, Judson avenue, Laurel, Lines, Martin, Munson, North avenue, Parmelee avenue, Pendleton, Porter, Read, Richard, Ridge, Rock, Shepard, Star, Sycamore, Thompson, Thorn, Warren place, Watson, Welton, and West street.

To perform this work it was necessary to prepare and serve 1013 notices to the owners or occupants of the buildings or parts of buildings to be numbered on said streets. In addition to numbering the buildings or parts of buildings on the streets, where the work was ordered by the Board of Aldermen, 96 buildings or parts of buildings in different parts of the city were numbered, upon the application of individuals.

MERE STONES.

Although during the years 1880 and 1881 the necessary information concerning the proper location of the lines of quite a large number of streets was secured, and the corners determined, yet, on account of other duties, we were unable to get the mere stones set.

EAST ROCK PARK.

The City Engineer Department has been engaged during the entire year upon work in connection with the layout of East Rock Park, and the assessments of damages and benefits for the same. The park, as laid out, covers $352\frac{8}{100}$ acres, $144\frac{2}{100}$ acres of which are in the City of New Haven, and the balance, $208\frac{6}{100}$ acres, in the Town of Hamden. The boundary line of the park may be described briefly, as follows: Commencing on the westerly line of State street, about five hundred feet northerly of Rock street; thence running northerly, along the westerly line of State street, 100 feet—this being for one of the main entrances; thence westerly, 90 feet; thence north-westerly, at the rear of the lots on State street, to Grotto street; thence along the southerly and westerly line of Grotto street to Albert street; thence along the northerly line of Albert street to a point 150 feet from State street; thence northerly, parallel to and 150 feet from State street, to the City line; thence north-westerly, across the lands to an old highway at the base of East Rock; thence northerly, along the old highway to a point near the “Peaked Rock,” sometimes called “Whitney Peak;” thence northerly across the lands to Ridge Road, at a point 780 feet from State street; thence along the south-westerly side of Ridge Road to Dickerman street; thence westerly, along the southerly side of Dickerman street, to the westerly side of the old New Haven and Hartford turnpike; thence southerly, along the westerly side of the old turnpike, to Whitney lake; thence along the easterly shore of Whitney lake, and around the easterly and southerly side of the works of the Whitney Arms Company, to Mill River; thence southerly, along the westerly bank of Mill River, to a point near the upland; thence westerly, to Whitney avenue, at the foot of the hill; thence southerly, along the easterly line of Whitney avenue, 50 feet; thence easterly and southerly to the corner of Burns street and Everitt street; thence southerly, along the easterly line of Everitt street, to Rock lane; thence easterly, along the northerly line of Rock lane, to a point 320 feet easterly

of Everitt street ; thence southerly, to Cold Spring street ; thence easterly, along the northerly line of Cold Spring street, 150 feet ; thence northerly 200 feet ; thence easterly and northerly, parallel to and 200 feet from Cold Spring and Orange streets, to the top of the bank near Cold Spring ; thence easterly to Orange street ; thence crossing Orange street, and easterly and southerly to the corner of Cold Spring street and Anderson street ; thence easterly to the northerly end of Nicoll street ; thence northeasterly to Mill River ; thence easterly, along the northerly line of Hemlock street, to a point 150 feet easterly of Rock street ; thence southerly, easterly and northerly, about parallel to Rock and State streets, to a point about 500 feet northerly of Rock street ; thence easterly to State street, to the place of beginning.

Convenient entrances to the park can be provided as follows : On State street, 550 feet northerly of Rock street ; at the southerly end of Grotto street ; at the westerly end of Albert street ; at the westerly end of a highway in Hamden, running westerly from State street ; on Ridge road ; at the corner of Ridge road and Dickerman street ; at the corner of Dickerman street and the old New Haven and Hartford turnpike ; on Whitney avenue, a little northerly of the City line ; at the corner of Burns street and Everitt street ; at the easterly end of Rock lane ; on Cold Spring street, opposite Livingston street ; on Orange street near Mill river ; at the corner of Cold Spring street and Anderson street ; at the corner of Sycamore street and Hemlock street ; and at the corner of Hemlock street and Rock street.

The map of the park has been completed, and the division lines of the different pieces of land have been carefully located.

For the Board of Compensation maps have been prepared showing all the lands of the park within the limits of the City, and with the ownership of the same. In addition to this, maps have been prepared showing the lands, with the ownership, of all that section of the City in the vicinity of the park. The titles to all lands have been examined and verified from a careful search of the records.

The total length of frontage on the streets of the City, not within the limits of the park, of which maps have been prepared for the Board of Compensation, the names of the owners of the adjoining lands furnished, and the titles to the same examined, amounts to *one hundred and twenty-five thousand five hundred and twenty* (125,520) *feet*, or $23\frac{17}{100}$ miles, and covering *nine hundred and fifty* separate lot fronts. Only those who have had experience in the searching of records will realize the magnitude of the work. Considerable work has also been given to the examination of the titles to the lands of the park lying within the limits of the Town of Hamden, particularly to those pieces that have been purchased by the East Rock Park Commission.

A new road has been constructed by the Park Commission, from the southerly end of Grotto street to the top of the eastern portion of Indian Head, from which point a fine view of the city, harbor, and surrounding country, for many miles, can be had. The length of the new road is 3,000 feet, and the location is such that easy grades are secured and a succession of interesting views presented as the sides of the mountain are ascended. Other roads and drives are projected, work upon which is expected to commence the coming season. All surveys, levels, lines, grades, etc., for work under the Park Commission, have, thus far, been made or given by the City Engineer Department.

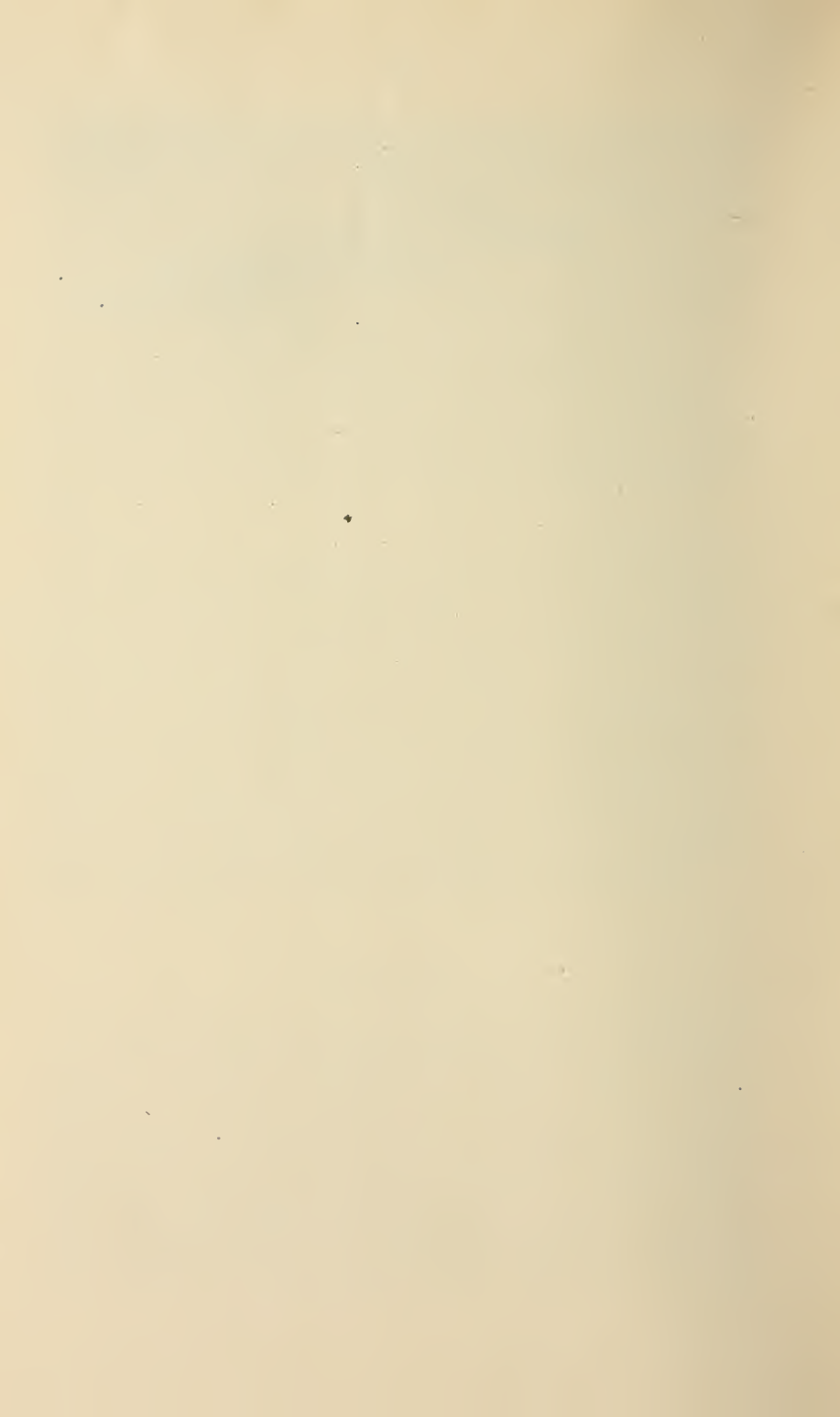
CONCLUSION.

The year 1881 was an unusually busy one for this Department, there being such a large amount of work of an extraordinary character in addition to regular duties. There has been an earnest endeavor to comply with all orders and complete the work required, but at times it was found impossible to keep up with the demand. In fact, office work was very much neglected, and the end of the year finds sufficient on hand to keep the Department busy for some months. The unfinished work will receive all the

attention that can be given to it during the winter months, and an effort made to complete it before the commencement of new work in the spring.

Respectfully submitted,

CHARLES E. FOWLER,
City Engineer.



REPORT
OF THE
SUPERINTENDENT OF STREETS.

1881.

DEPARTMENT SUPT. OF STREETS.

Office, Room No. 17, City Hall.

SUPERINTENDENT OF STREETS.

PATRICK DOYLE.

Residence, 210 Ferry st.

CLERK.

FREDERICK H. WALDRON.

Residence, 105 Howe st.

SUPERINTENDENT OF PARKS.

HENRY F. ANDRUSS.

Residence, 80 Chapel st.

INSPECTOR OF SIDEWALKS.

HENRY J. MATTOON.

Residence, 142 Bradley st.

REPORT

OF THE

SUPERINTENDENT OF STREETS.

To the Hon. Board of Public Works:

I have the honor to submit herewith a report of my official acts for the year ending Nov. 30, 1881.

I have constructed, by order of your Honorable Board, twenty-four new crosswalks in addition to quite a number which have been relaid and otherwise repaired.

Cobble gutters have been constructed on Market street, north side, from James to Haven street, also front of the lot occupied by Steam Fire Engine, N^o. 8, on Edward street.

The heavy snow of last winter necessitated the employment of a large number of men and teams and the expenditure of a large amount of money to keep the streets in the center of the City in reasonable good condition; this was especially the case in those thoroughfares where there were horse railroad tracks. This work took over \$3,000.00 from the appropriation of general repairs, ordinary labor, etc. From this appropriation was also taken the amount paid labor for cleaning the catch basins and receiving basins, also the carting of the material therefrom. These moneys taken from the above-named sources, necessitated a suspension of most of the work of a general character in my Department last September, until an additional appropriation or transfer of funds could be made by the Court of Common Council.

The total amount expended for general repairs, ordinary

labor, and turnpiking streets, including the work before spoken of, was \$29,676.91.

During the past year I have made some investigation in the working of the labor-saving machines for turnpiking and rounding up roadways. I have, on several occasions, witnessed those now owned by the Town of Hamden at work on the roadway, and think they could be used to advantage upon our dirt roads, and their use would result in a saving to the City. I would respectfully recommend that one or more of these or similar machines be purchased for use in this Department.

I have, during the past few years, experienced considerable trouble and annoyance from the dumping of refuse material, etc., upon the roadway and walks of Commerce street. I have endeavored to have the offenders punished, but it is almost impossible to find the offenders, the nuisance being committed in the night season or early morning. The proper way to obviate the difficulty, in my opinion, is to have the walks graded and curbstones set. This being one of the central streets, the putting of it in proper condition should be no longer delayed, and I respectfully suggest that your Honorable Board bring this matter to the attention of the Court of Common Council, and the proper orders passed for curbing and grading these walks.

There have been 24,970 feet, or nearly four and three-quarter miles of walks graded, curbed or paved in accordance with orders from the Court of Common Council. In addition thereto, there have been 810 feet brick walk relaid, 1,663 feet of concrete walk laid or relaid, 413 feet of flag walks relaid, and 192 repairs around cellar doors, coal holes, etc., under the direction of the Sidewalk Inspector, without direct orders from the Court of Common Council.

Nine thousand nine hundred and fifty-seven loads of material have been carted from the paved streets.

Respectfully submitted,

PATRICK DOYLE,

Supt. of Streets.

DEPARTMENT OF PUBLIC WORKS—Statement No. 1.

WORK ON SEWERS IN 1881.

STREET.	Contractor.	Length.	Size and Material.	Cost of Sewers.	Cost of Appurtenances.	Total Cost.
Chapel street, cor. of Norton.....	Wm. Grandfield	34.	15 in. V. P.	\$49.30	\$324.04	\$373.34
Clark street, State to Orange.....	Lawr'nce O'Brien	1151.8	24 in. B.	2879.50	1,557.59	4,437.09
Congress avenue, Cedar to Daggett streets.....	Wm. Grandfield	62.2	24 in. B. 8 in. I.	295.45		
Congress avenue, Cedar to Daggett streets.....	Wm. Grandfield	328.2	24 in. B. 4 in. I.	1109.32		
Congress avenue, Cedar to Daggett streets.....	Wm. Grandfield	59.9	15 in. V. P.	143.76	2,142.49	5,078.02
Congress avenue, Cedar to Daggett streets.....	Wm. Grandfield	730.	12 in. V. P.	1387.00		
Eld street, State to Orange streets.....	Lawr'nce O'Brien	597.7	15 in. V. P.	1016.09		
Eld street, State to Orange streets.....	Lawr'nce O'Brien	312.2	12 in. V. P.	374.64		
Elm street, Garden to Kensington streets.....	Wm. Grandfield	367.8	15 in. V. P.	496.53		
Gilbert street, cor. of Howard avenue.....	Lawr'nce O'Brien	51.1	15 in. V. P.	127.75	964.68	2,355.41
Howard avenue R. R. to Congress avenue.....	Lawr'nce O'Brien	83.1	30 in. B. 8 in. I.	407.19		
Howard avenue R. R. to Congress avenue.....	Lawr'nce O'Brien	723.3	24 in. B. 4 in. I.	2589.41		
Library street, High street, westerly.....	Matthew Kehoe..	141.5	12 in. V. P.	141.50	77.36	218.86
Norton street, Derby avenue to Chapel street.....	Wm. Grandfield	568.8	15 in. V. P.	824.76	751.26	1,576.02
Oak street, York to Spruce streets.....	Wm. Grandfield	271.3	15 in. V. P.	420.52	449.97	870.49
Silver street extension, Cedar to Howard avenue.	Lawr'nce O'Brien	599.5	30 in. B. 8 in. I.	2937.55	375.36	3,312.91
Spruce street, Oak to George streets.....	Wm. Grandfield	549.5	15 in. V. and C. P.	851.73	395.26	1,246.99
Vernon street, Congress to Davenport avenues.....	Matthew Kehoe..	333.3	15 in. V. P.	799.92	Not completed.	
Vernon street, Congress to Davenport avenues.....	Matthew Kehoe..	316.5	12 in. V. P.	601.35		
Vernon street, cor. Congress avenue.....	Wm. Grandfield	28.4	15 in. V. P.	68.16		68.16
Wall street, High street, westerly.....	Matthew Kehoe..	105.4	12 in. V. P.	105.40	209.96	315.36
Washington street, cor. Howard avenue.....	Lawr'nce O'Brien	55.7	15 in. V. P.	139.25	218.75	358.00
Water street, East to Bridge street.....	Wm. Grandfield	36.2	15 in. V. P.	Commen ced in 1880.		1,351.26

NOTE.—The "total cost" of the Sewers, includes the final payments to be made in 1882.

DEPARTMENT OF PUBLIC WORKS—Statement No. 2.
SEWER CONTRACTS COMPLETED IN 1881.

STREETS.	Size and Material	Average Cut.	Nature of Excavation.	Contract Price per Foot.
Howard avenue, R. R. to Washington street...	30 in. B. 8 in. I.	15.3	Sand and Loam	\$4.90
Silver st. extension, Cedar st. to Howard ave...	30 in. B. 8 in. I.	6.1	Sand and Loam	4.90
Clark street, State to Orange streets	24 in. B. 4 in. I.	14.6	Sand and Gravel	2.50
Congress avenue, cor. of Howard avenue	24 in. B. 8 in. I.	12.0	Sand	4.75
Congress avenue, Howard ave. to Vernon st...	24 in. B. 4 in. I.	12.0	Sand	3.88
Howard ave., Washington st. to Congress ave.	24 in. B. 4 in. I.	11.7	Sand	3.58
Chapel street, cor. of Norton street	15 in. V. P.	12.8	Sand	1.45
Congress avenue, cor. of Howard avenue	15 in. V. P.	11.4	Sand	2.40
Eld street, State to Orange streets	15 in. V. P.	12.7	Sand and Gravel	1.70
Elm street, Garden to Kensington streets	15 in. V. P.	7.0	Sand and Loam	1.35
Gilbert street, cor. Howard ave.	15 in. V. P.	11.0	Sand	2.50
Norton street, Derby avenue to Chapel street..	15 in. V. P.	13.3	Sand	1.45
Oak street, York to Spruce streets	15 in. V. P.	14.9	Sand and Loam	1.55
Spruce street, Oak to George streets	15 in. V. and C. P.	11.6	Sand and Loam	1.55
Vernon street, cor. Congress avenue	15 in. V. P.	11.6	Sand	2.40
Vernon street, Congress to Davenport avenues.	15 in. V. P.	11.6	Sand	2.40
Washington street, cor. of Howard avenue	15 in. V. P.	12.	Sand and Loam	2.50
* Water street, East to Bridge street	15 in. V. P.	6.	Sand and Loam	1.35
Congress avenue, Cedar to Daggett streets	12 in. V. P.	10.6	Sand	1.90
Eld street, State to Orange street	12 in. V. P.	9.8	Sand and Gravel	1.20
Library street, High street, westerly	12 in. V. P.	10.7	Sand	1.00
Vernon street, Congress to Davenport avenues.	12 in. V. P.	10.8	Sand	1.90
Wall street, High street, westerly	12 in. V. P.	8.1	Sand	1.00

* Commenced in 1880.

DEPARTMENT OF PUBLIC WORKS—Statement No. 3.

COMPARISON OF BIDS FOR SEWERS.

LOCATION.	Contractors.	24 in. Sewer. 8 in. I.	24 in. Sewer. 4 in. I.	15 in. Sewer.	12 in. Sewer.	12 in. Culverts.	Catch Basins.	Receiving Basins.	Manholes.	Total Bid according to Estimates of Quantities.
Clark st.	{ Michael Fitzpatrick		\$3 95			\$1.80	\$120.00	\$20.00	\$50.00	\$5,750.50
	{ Matthew Kehoe.....		3.00			1.25	110.00	15.00	40.00	4,455.00
	{ William E. Davis		2.90			90	110.00	12.00	40.00	4,281.00
	{ William Grandfield.....		2.85			1.00	105.00	14.00	45.00	4,246.50
Congress ave.	{ Lawrence O'Brien*.....		2.50			90	100.00	10.00	50.00	3,829.00
	{ Matthew Kehoe.....	\$5.00	3.60	\$2.30	\$1.95	1.15	130.00	20.00	50.00	4,799.00
	{ William Grandfield*.....	4.75	3.38	2.40	1.90	1.25	130.00	15.00	40.00	4,611.60
	{ Michael Fitzpatrick			1.95	1.65	1.20	120.00		45.00	2,523.00
Eld st.	{ Matthew Kehoe.....			1.80	1.40	1.20	110.00		40.00	2,288.00
	{ William Grandfield.....			1.80	1.50	90	105.00		40.00	2,271.00
	{ Lawrence O'Brien*.....			1.70	1.20	90	100.00		45.00	2,131.00
	{ Michael Fitzpatrick.....			1.95		1.25	120.00		45.00	1,180.50
Elm st	{ William E. Davis			1.60		80	110.00		30.00	954.00
	{ Matthew Kehoe			1.50		90	110.00		35.00	940.00
	{ Lawrence O'Brien.....			1.40		85	100.00		35.00	879.75
	{ William Grandfield*.....			1.35		90	102.00		35.00	869.25
Vernon st.	{ William Grandfield.....			2.50	2.10	1.50	138.00		53.00	2,495.00
	{ Matthew Kehoe*.....			2.40	1.90	1.40	133.00		53.00	2,364.00

* Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 3.—(Continued.)

COMPARISON OF BIDS FOR SEWERS.

LOCATION.	Contractors.	30 in. Sewer 8 in. I.	24 in. Sewer 4 in. I.	15 in. Sewer.	12 in. Culvert.	Catch Basins.	Lamp- holes.	Manholes.	Total Bid according to Estimates of Quantities.
Norton st.	{ Michael Fitzpatrick.....	.....	.....	\$2 45	\$1 35	\$120.00	.....	\$50.00	\$2,573.00
	{ Matthew Kehoe.....	.....	.....	1.85	1.20	110.00	.....	40.00	2,079.50
	{ Lawrence O'Brien.....	.....	.....	1.90	1.00	100.00	.....	50.00	2,067.00
	{ William E. Davis.....	.....	.....	1.65	1.25	110.00	.....	40.00	1,962.00
Library and Wall sts.	{ William Grandfield*.....	.....	.....	1.45	.90	105.00	.....	40.00	1,751.50
	{ William E. Davis.....	.....	.....	.....	\$1 25 .....	.....	\$10.00	40.00	425.00
	{ Patrick Maher.....	.....	.....	.....	1.29 .....	.....	6.50	37.50	423.40
	{ Lawrence O'Brien.....	.....	.....	.....	1.20 .....	.....	10.00	35.00	412.00
Silver st. exten- sion and How- ard ave.	{ Matthew Kehoe*.....	.....	.....	.....	1.00 .....	.....	10.00	40.00	360.00
	{ Michael Fitzpatrick.....	\$5.10	\$3 78	2.60 .....	.....	135.00	.....	55.00	8,129.40
	{ Matthew Kehoe.....	5.00	3.85	2.60	1.35	130.00	.....	50.00	7,979.50
	{ William E. Davis.....	5.20	3.65	2.60	1.30	120.00	.....	55.00	7,958.50
Oak and Spruce sts.	{ Patrick Maher.....	5.10	3.65	2.30	1.25	127.30	.....	47.00	7,817.50
	{ William Grandfield.....	4.85	3.78	2.50	1.24	130.00	.....	48.00	7,770.00
	{ Lawrence O'Brien*.....	4.90	3.58	2.50	1.25	125.00	.....	50.00	7,654.40
	{ Michael Fitzpatrick.....	.....	.....	2.45	1.85	120.00	.....	60.00	2,947.75
Oak and Spruce sts.	{ Matthew Kehoe.....	.....	.....	2.25	1.50	110.00	.....	47.00	2,637.00
	{ William E. Davis.....	.....	.....	2.20	.90	110.00	.....	45.00	2,530.50
	{ William Grandfield*.....	.....	.....	1.55	.90	105.00	.....	38.00	1,924.00

* Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 4.

STREETS PAVED IN 1881.

STREET.	Location.	Contractor.	Kind of Pavement.	Length in Feet.	Number of Square Yards.	*Cost per Square Yard.	Total Cost.
Church.....	George to Chapel.....	G. Pohlman.....	Belgian.....	†	791.58	.....	.....
Court.....	State to Orange.....	C. W. Blakeslee & Son...	Belgian.....	410	1,047.75	\$1.80	\$1,885.95
Crown.	Church to Temple.....	G. Pohlman.....	Telford.....	348	1,072.33	†	
Water.....	Bridge to Franklin.....	G. Pohlman.....	Belgian.....	390	1,763.28	1.25	\$17,577.22§
Water.....	Franklin to Olive.....	G. Pohlman.....	Belgian.....	1,717	7,491.77		
				2,865	12,166.71		

* "Cost per square yard" includes contract price, expense of rolling, inspectors, crushed stone, etc.

† 844 lineal feet of Telford between rails of H. R. R., and two feet outside replaced with Belgian.

‡ The foundation layers were stone from between the rails of H. R. R. track on Church street.

§ This total cost includes that portion of Water street, from East to Franklin, laid in 1880.

NOTE.—The "total cost" includes final payments to be made in 1882.

DEPARTMENT OF PUBLIC WORKS—Statement No. 5.

BIDS FOR STREET PAVING IN 1881.

STREET.	Location.	Kind of Pavement.	Bidders.	Bids per Square Yard.
+Church.....	George to Chapel.....	Belgian.....	{ Alling & Smith..... C. W. Blakeslee & Son..... *G. Pohlman.....	\$1.31 1.62 1.54
Court.....	State to Orange.....	Belgian.....	{ *C. W. Blakeslee & Son... G. Pohlman.....	1.70 1.75
+Crown.....	Church to Temple.....	Telford.....	{ Alling & Smith..... C. W. Blakeslee & Son..... *G. Pohlman.....	1.02 .95 .75
Water.....	Franklin to Olive.....	Belgian.....	{ C. W. Blakeslee & Son..... *G. Pohlman.....	1.33 1.29

* Awarded the Contract.

+ Church street and Crown street were one contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6.

SHOWING REPAIRS OF PAVEMENTS DURING 1881.

LOCATION.	Kind of Pavement.	Between what Points.	Work Done.	Cost.
Chapel street.....	Telford.	West of York.....	Top Dressed.....	\$111.75
Church street.....	.....	Crown to George street.....	Top Dressed.....	343.34
Court street.....	.....	State to Olive street.....	Top Dressed.....	117.80
Congress avenue.....	.....	George to Cedar street.....	.....	54.05
Elm street.....	.....	.....	.....	183.94
East street.....	.....	Chapel to Greene street.....	.....	99.74
George street.....	Telford.	.....	.....	151.23
Orange street.....	.....	.....	.....	970.23
Olive street.....	.....	.....	.....	185.25
State street.....	Belgian.	Chapel to Court street.....	Repairs, Gutters.....	89.51
State street.....	Telford.	Elm to Humphrey street.....	Top Dressed.....	1,142.03
St. John street.....	.....	.....	.....	645.62
Temple street.....	.....	.....	.....	117.74
Wooster street.....	.....	.....	.....	783.88
Whalley avenue.....	.....	.....	.....	421.74
York street.....	.....	.....	.....	123.25

DEPARTMENT OF PUBLIC WORKS—Statement No. 7.

SHOWING STREETS GRADED DURING 1881.

STREET.	Between what Points.	Contractor.	Cubic Y rds.	Length in Feet.	Total Cost.
Burns.....		City.....		400	\$58.44
Chapel.....	Causeway, near West River.....	W. J. Montgomery.....	890		148.75
English.....	Ferry to 165 feet east of Ferry.....	R. Connor.....	230	165	43.70
Everitt.....		City.....		1880	20.00
Ferry.....	English to Peck.....	R. Connor.....	30	100	5.70
Lawrence.....	Whitney avenue to St. Ronan street....	City.....		400	104.87
Park.....	Elm to Chapel.....	City.....		960	264.06
Peck.....	Ferry to 165 feet east of Ferry.....	R. Connor.....	188	165	35.72
Total.....					\$681.24

DEPARTMENT OF PUBLIC WORKS—Statement No. 8.

SHOWING STREETS TURNPIKED DURING 1881.

STREETS.	COST.
Ashmun.....	\$35.70
Broad.....	56.17
Crown, York to Howe.....	58.35
College.....	30.00
Congress avenue.....	179.40
Chambers.....	83.08
Dixwell avenue.....	22.50
Davenport avenue.....	21.24
Elm.....	60.00
Everett.....	138.16
Goffe.....	60.50
Grand (East), cinders.....	107.25
George.....	101.00
Grove.....	80.00
Howard avenue.....	257.35
Howe.....	139.40
Hobart.....	45.00
James.....	72.19
Kimberly avenue, shells.....	323.39
Liberty.....	3.96
Market.....	40.85
North avenue.....	113.34
Orchard.....	9.60
Pine.....	15.30
River.....	33.00
State.....	46.75
Whitney avenue.....	152.58
Winthrop avenue.....	56.50
Ward.....	75.50
Wallace.....	41.25
York.....	55.32

Kimberly avenue, ...	\$103.50
Kossuth street, ...	9.00
Lock street, ...	3.00
Lyon street, ...	9.00
Lloyd street, ...	30.00
Lawrence street, ...	115.50
Lamberton street, ...	7.50
Lafayette street, ...	51.00
Linden street, ...	9.00
Liberty street, ...	37.50
Linwood street, ...	15.00
Middletown avenue, ...	19.50
Miner street, ...	7.50
Martin street, ...	73.50
Market street, ...	106.50
Main street, ...	4.50
Myrtle street, ...	10.50
Munson street, ...	63.00
Mansfield street, ...	9.00
Meadow street, ...	52.50
Nicoll street, ...	13.50
Nash street, ...	6.00
Norton street, ...	24.00
Oak street, ...	102.00
Orchard street, ...	75.00
Orange street, ...	30.00
Olive street, ...	10.50
Osborn street, ...	3.00
Park street, ...	135.00
Prospect street, ...	120.00
Pearl street, ...	21.00
Pleasant street, ...	7.50
Prince street, ...	7.50
Poplar street, ...	6.00
Putnam street, ...	30.00
Portsea street, ...	42.00
Pine street, ...	6.00
Rose street, ...	7.50
Rock street, ...	42.00
Rosette street, ...	19.50
River street, ...	24.00
Redfield street, ...	7.50
Spring street, ...	28.50
Silver street, ...	21.00
State street, ...	183.00
Sherman avenue, ...	46.50
Summer street, ...	24.00
Sylvan avenue, ...	42.00

DEPARTMENT OF PUBLIC WORKS—Statement No. 10.

SHOWING WORK ON BRIDGES DURING 1881.

NAME.	Location.	Work Done.	Cost.	Total Cost.
Barnesville.....	Mill River—Grand street.....	Repairs—Causeway.....	.....	\$19.25
Chapel street.....	West River.....	Repairs.....	.....	17.63
Chapel street.....	Mill River.....	Salary Bridge Tender.....	\$720.00	.....
Chapel street.....	Mill River.....	Repairs.....	276.57	996.57
Congress avenue.....	West River.....	Repairs.....	.....	222.46
Oak street.....	West River.....	Repairs.....	.....	46.77
Portsea street.....	Over Derby R. R. tracks.....	New Extension.....	.....	729.12
Quinnipiac.....	Quinnipiac River.....	Salary Bridge Tender.....	399.96	.....
Quinnipiac.....	Quinnipiac River.....	Half Expense Repairs.....	130.49	530.45
Quinnipiac.....	Grand street.....	Repairs.....	.....	85.14
Washington street.....	West River.....	Repairs.....	.....	3.25

DEPARTMENT OF PUBLIC WORKS—Statement No. 11.

SHOWING OPENINGS OF DRAW BRIDGES.

MONTH.	QUINNIPIAC BRIDGE.						CHAPEL STREET BRIDGE.					
	Steamers.	Schooners.	Sloops.	Sharpies.	Miss.	Total.	Tugs.	Barges.	Schooners.	Sloops.	Scows.	Total.
1880. December...	130	30	16	12	2	188	207	82	31	.....	4	324
1881. January....	4	3	.....	.....	.....	9	31	5	.....	1	.....	37
“ February....	52	6	.....	.....	1	59	31	15	.....	1	.....	51
“ March	127	30	7	42	.....	206	127	52	2	5	2	201
“ April.....	158	44	10	235	.....	447	138	61	21	11	.....	231
“ May	144	15	42	250	.....	451	138	58	18	11	.....	229
“ June.....	134	22	67	223	.....	446	165	75	15	8	5	268
“ July	198	80	295	124	.....	697	181	96	14	4	16	311
“ August.....	234	64	108	138	.....	544	177	104	21	12	9	323
“ September..	195	13	20	283	.....	511	165	66	15	8	19	273
“ October.....	192	13	38	300	.....	543	141	58	12	7	9	227
“ November..	229	29	24	226	.....	508	75	74	25	14	3	191
Total	1797	349	627	1833	3	4609	1576	746	189	82	73	2666

DEPARTMENT OF PUBLIC WORKS—Statement No. 12.

SHOWING NEW CROSSWALKS CONSTRUCTED DURING 1881.

STREET.	LOCATION.	SIDE.
Carlisle.....	Across Liberty.....	South.
Cedar.....	“ Spring.....	East.
Cedar.....	“ Carlisle.....	“
Cedar.....	“ Columbus.....	“
Chapel.....	“ Gregson.....	South.
Eaton.....	“ Ashmun.....	“
Ferry.....	“ Peck.....	East.
Foote.....	“ Ashmun.....	North.
Foote.....	“ “.....	South.
Frank.....	“ Portsea.....	“
Gregory.....	“ Ashmun.....	North.
Greenwich ave..	“ Kimberly ave.....	West.
Hudson.....	“ Whalley ave.....	East.
Lock.....	To Canal.....	North.
Lombard.....	Across Jackson.....	“
Nicoll.....	“ Willow.....	West.
Peck.....	“ Ferry.....	South.
Prospect.....	“ Trumbull.....	East.
Stevens.....	“ Sylvan ave.....	“
Webster.....	“ Ashmun.....	North.
Whalley ave....	“ Norton.....	South.
Willow.....	“ Anderson.....	North.
Willow.....	“ Foster.....	“
Across Hamilton.	Between St. John and Grand.....	“

DEPARTMENT OF PUBLIC WORKS—Statement No. 13.

SHOWING SIDEWALKS COMPLETED DURING 1881.

STREET.	Between what Points.	Side.	Material.
Arch	Congress to Columbus ave	East.	Brick.
Broad	George to Commerce st.	West.	Brick.
Carlisle	Liberty to Water st.	Both.	Concrete.
Chapel	York to 529 Chapel st.	North.	Relay.
College	Wall to Grove st.	East.	Relay.
College	Crown to George st.	West.	Relay.
Congress avenue.	Redfield st. to No. 460.	South.	Relay.
Court	Orange to State st.	Both.	Relay.
Crown	Church to Temple st.	Both.	Relay.
Court	No. 28 to Olive st.	North.	Relay.
Crown	Church to Orange st.	North.	Flag.
Dickerman	Orchard to 83 Dickerman st.	North.	Concrete.
Edward	Whitney ave. to Orange st.	North.	Concrete.
Edward	Foster to State st.	South.	Concrete.
Franklin	Grand to William st.	West.	Relay.
Grand	Poplar to Ferry st.	South.	Relay.
Greenwood	Sylvan ave. to Oak st.	East.	Grade and Curb
Lombard	Ferry to Monroe st.	North.	Concrete.
Linwood	Martin to Elm street.	Both.	Grade and Curb
Market	Haven to James st.	North.	Curb.
Minor	Cedar to Lafayette st.	Both.	Brick.
Norton	Whalley ave. to Elm st.	West.	Concrete.
Olive	No. 96 to Chapel	West.	Relay.
Orchard	Elm to Martin st.	East.	Brick.
Park	Chapel to Elm st.	Both.	Relay.
State	Trumbull to 672 State st.	N. West.	Relay.
Trumbull	Prospect st. to present walk.	North.	Brick.
Union	Court to 143 Union st.	East.	Relay.
Washington	Congress ave to Cedar st.	Both.	Relay.
Water (East)	R. R. crossing to Bridge st.	South.	Grade and Curb
Willow	Orange to Nicoll st.	North.	Concrete.
Wall	Temple to College st.	North.	Relay.
Winthrop avenue	Whalley ave. to Elm st.	West.	Concrete.

DEPARTMENT OF PUBLIC WORKS—Statement No. 14.

SHOWING AMOUNT EXPENDED DURING 1881.

Bridges,	\$2,650.64
City Inspector's Department,	3,408.30
City Engineer's Department,	6,252.41
Contingent Expenses,	1,480.43
Crosswalks,	3,889.36
Cobble Gutters,	921.02
Cleaning Sewers,	2,019.90
Drainage,	4,480.85
General Repairs,	10,005.40
Grading Streets,	681.24
Opening and Widening Streets,	10,631.30
Ordinary Labor,	17,151.40
Paving Streets,	17,844.55
Public Parks,	6,128.42
Road Roller,	415.04
Stone Crusher,	6,221.16
Surveyors' Supplies,	87.81
Sewers,	22,521.79
Tools,	598.92
Turnpiking Streets,	2,520.11
Walks and Curbs,	190.69
Wharfage,	195.81
	\$120,296.55

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E. S. Chesbrough
From A. B. Hill
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ANNUAL REPORTS

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DEPARTMENT

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BOARD OF PUBLIC WORKS,

CITY OF NEW HAVEN, CONN.,

For the Year 1882.

NEW HAVEN:

O. A. DORMAN, PRINTER AND MANUFACTURING STATIONER, 196 CHAPEL ST.

1883.

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1883.

BOARD OF PUBLIC WORKS.

PRESIDENT.

HON. JOHN B. ROBERTSON, Mayor, *ex-officio*.

JONATHAN W. POND, *President*.

Term expires Feb. 1, 1885.

Residence, 220 Whalley Avenue.

JOEL F. GILBERT.

Term expires Feb. 1, 1885.

Residence, 413 Whalley Avenue.

JOSEPH L. JOYCE.

Term expires Feb. 1, 1883.

Residence, 358 Whalley Avenue.

LOUIS FELDMAN.

Term expires Feb. 1, 1883.

Residence, 164 Olive Street.

MICHAEL COLEMAN.

Term expires Feb. 1, 1884.

Residence, 58 Houston Street.

JOSEPH B. SARGENT.

Term expires Feb. 1, 1884.

Residence, 51 Elm Street.

CLERK.

FRED. H. WALDRON.

Regular Meetings of the Board Wednesday evening preceding the first Thursday in each month, Room 16, City Hall.

352.5
145
1881/82

REPORT

OF THE

BOARD OF PUBLIC WORKS.

To the Honorable Court of Common Council:

I have the honor to transmit herewith the Annual Report of the Board of Public Works for the year ending Nov. 30, 1882.

This Board has received from your Honorable Body one hundred and two orders, resolutions, etc., during the year, as follows:

49 for sidewalks and curbs,	8 for paving streets,
12 for opening, widening, extending and laying out new streets.	3 for grading streets
11 for sewers,	3 for bridges,
13 miscellaneous.	3 for crosswalks,

This is a larger number of orders sent to the Board for execution than has been transmitted to them in a number of previous years. Many of the above named orders could not be executed for the want of funds, there not having been sufficient appropriations for the purpose.

BRIDGES.

The most important works under this head were the commencement of the new iron bridge over West River, on the line of Chapel street, and the new iron bridge over the track of the New York, New Haven and Hartford R. R., on the line of Lamberton street.

The bridge over West River is being built in conjunction

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with the Board of Selectmen of the Town of New Haven, the Town paying one-half of the expense, which will be approximately \$13,300.00.

The contract for the abutments was awarded to Mr. Robert Redfield, for \$6,213.00, and the iron superstructure was awarded to the Corrugated Metal Co., of East Berlin, Conn., for \$6,990.00.

The construction of this bridge was rendered necessary by the washing away of a wooden structure in the Spring of 1881. The former bridge was located about 600 feet east of the present new bridge; the straightening of West River, between Chapel street and Martin street, changed the channel further west.

In August, 1878, your Honorable Body adopted an order directing this Board to build an iron bridge on Lamberton street, across the tracks of the New York, New Haven and Hartford Railroad Company, in connection with this company, but no appropriation had been made for the purpose of doing this work until last year, when a special appropriation was made for the building of this bridge.

The matter was referred to a Committee of this Board to proceed with the work.

This Committee, acting in conjunction with the Railroad authorities, immediately prepared plans and asked for proposals for doing this work. The contract for the abutments and pier was awarded to Robert Redfield for \$15,600.00, and the iron superstructure was awarded to the Penn Bridge Co., of Beacon Falls, Penn., for \$12,848.00. The bridge will be completed early in the coming year.

Repairs have been made on the Chapel street draw-bridge over Mill River, amounting to \$522.94.

Extensive repairs have been made on the Quinnipiac draw-bridge, center pier, in conjunction with the Town authorities, the Town paying one-half the expense, the cost to the City amounting to \$1,297.45.

During the year Quinnipiac draw was opened 4,827 times and the Chapel street draw was opened 3,761 times. A detailed statement will be found by reference to table No. 8, accompanying these reports.

WEST RIVER STRAIGHTENING.

Late in the year 1881 preliminary steps were taken for straightening that portion of West River lying between Derby avenue and Martin street.

Sept. 21st, 1881, parties in interest were heard in relation to the project. In the latter part of the month of October, 1881, orders were received authorizing this Board to act with the Selectmen of the Town of New Haven in this matter. This Board referred the order to a committee consisting of Messrs. J. W. Pond, J. B. Sargent and Joel F. Gilbert, to act with a committee of like number from the Board of Selectmen in the execution of this order. The Selectmen appointed a committee to co-operate with the Board and they immediately entered upon their labors. After the preliminaries were arranged, proposals were solicited for doing the work by contract; bids were received, and the contract awarded to Solomon Mead for \$2,250.00. The work is substantially completed.

PAVEMENTS.

New pavements have been constructed on the following named streets and avenues:

Howard avenue, from Congress to Kimberly avenue.

Congress avenue, from Cedar to Bond street.

Brewery street, from Water street to Basin Wharf.

High street, from Chapel to Crown street.

The length added to the paved streets is $1\frac{312}{1000}$ miles, making a total length of paved streets of $15\frac{265}{1000}$ miles.

In addition to the above, the upper end of State street has been hardened and repaired.

There are still in the files of the Board orders for pavements on Dixwell avenue, concrete pavement on Court street, from Orange to Church street, and for light pavements on Washington street and Kimberly avenue.

SEWERS.

Sewers have been completed during the past year as follows:

Anderson street—Orange street to Whitney avenue.
 Daggett street—Washington street to Congress avenue.
 Dixwell avenue—Eaton street to Henry street.
 Edward street—State street to Nicoll street.
 Foote street—Ashmun street to Dixwell avenue.
 Franklin street—St. John street to Grand street.
 Gill street—Chapel street to Martin street.
 Grove street—Church street to Orange street.
 Hamilton street—Humphrey street to Walnut street.
 Hillhouse avenue—Trumbull street to Sachem street.
 Hughes Place—Greene street to St. John street.
 Liberty street—Derby R. R. to Columbus avenue.
 Lincoln street—Trumbull street to Bradley street.
 Washington street—Howard avenue to Daggett street.

The total length of these sewers is $1\frac{765}{1000}$ miles, which, added to the sewers heretofore completed, makes the total length of sewers in use at the present time $36\frac{503}{1000}$ miles.

The Board have the following named orders for sewers, which have been ordered by your Honorable Body, but have not been completed for the want of appropriations :

Anderson street—Canner street to Cold Spring street.
 Elm street—Dwight street to University place.
 Howard avenue—Congress avenue to Davenport avenue.
 James street—Woleott street to Quinnipiac River.
 Lawrence street—Whitney avenue 300 feet west.
 Poplar street—Grand street to Quinnipiac River.
 University place—Whalley avenue to Elm street.
 Rebuilding the Grand street sewer.

PUBLIC PARKS.

Two new concrete walks have been constructed on the Old Green during the past year, one from the corner of Church and Elm streets to the corner of Chapel and Temple streets, the other from the corner of Church and Court streets to the corner of Elm and Temple streets.

The amount expended on Parks during the past year is as follows :

PARKS.	
Superintendent, ...	\$1,100.00
Labor, ...	2,163.94
Cutting Grass, etc., ...	568.18
Tools and Repairs, ...	101.39

Posts and Signs, ...	\$36.23	
Painting Fence, ...	121.78	
New Settees, ...	221.38	
Repairs on Settees, ...	32.83	
		\$4,345.73

OLD GREEN.

New Walks, ...	\$556.16	
Repairs on Walks, ...	263.24	
Turf, ...	275.09	
Pipe Drains, ...	68.00	
		1,162.49

CLINTON PARK.

Grading, ...	\$440.64	
Trees, ...	18.00	
		458.64

MUNSON PARK.

Grading, ...	\$288.53	
Posts, ...	3.00	
		291.53

HAMILTON SQUARE.

Trees, ...		2.00
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SPIREWORTH SQUARE.

Repairs on Fences, ...		5.45
------------------------------	--	------

WOOSTER SQUARE.

Repairs on Walks, ...	\$9.56	
Turf, ...	14.69	
		24 25
		\$6,290.09

OPENING AND WIDENING STREETS.

Layouts have been submitted to your Honorable Body by the Board as follows:

For widening and extending Temple street to Congress avenue.

For the layout of a new street, known as Bright street, running from Grand to Pine street.

For straightening of West river, from Chapel to Martin streets.

For widening of Veto street.

For extension of Webster street to Winchester avenue.

For widening and extending Brewery street to Long wharf.

For a new street on the lands of Yale College, from St. Ronan to Prospect street.

For widening Dwight street, between Chapel and Martin streets.

Hearings have also been had by this Board for laying out a new boulevard from Oyster Point to Whalley avenue, on the western boundaries of the city, and for the widening of Meadow street.

STONE CRUSHER.

During the past year there have been $9,076\frac{41}{100}$ cubic yards of stone crushed at the crushing works, being a larger amount of stone crushed than during any year since 1874.

The amount expended during the past year has been \$11,903.26, which includes the cost of a new crusher machine, to be placed in position during the coming winter. Last spring a new Blake Challenge Crusher was put in the works, which has been in use most of the time during the past season.

DRINKING FOUNTAINS.

All the horse drinking fountains have been connected so as to make a continuous flow of water into them, and the overflow connected with the sewers. One new tank has been erected at the corner of State and Hamilton streets. These tanks are located as follows:

- One junction Grand and St. John streets.
- One junction Congress avenue and Washington street.
- One junction Broadway and Elm street.
- One corner River and Ferry streets.
- One corner State and Hamilton streets.
- One on East street, near corner of Grand street.
- One junction Bridge and Water streets.

In addition to these there are several individual drinking fountains located on the sidewalks, the care of which has never been turned over to this Board. They were erected several years ago by a special committee of the Court of Common Council, and it is a question whether the expense of keeping them in repair, etc., compensates for the very limited use of them.

Respectfully submitted in behalf of the Board,

FRED. H. WALDRON, *Clerk.*

REPORT
OF THE
CITY ENGINEER.

1882.

CITY ENGINEER DEPARTMENT.

City Engineer's Office : Room No. 17, City Hall.
Asst. Engineer's Office : Room No. 18, City Hall.
Draughting Room : Room No. 24, City Hall.

CITY ENGINEER.

*CHARLES E. FOWLER, Residence, 374 Whalley Avenue.

ASSISTANT CITY ENGINEER.

ALBERT B. HILL, . Residence, 176 York Street.

ASST. ENGINEER IN CHARGE OF SEWERAGE WORK.

CHARLES A. FERRY, . Residence, 104 Liberty Street.

ASST. ENGINEER IN CHARGE OF STREET WORK.

CASSIUS W. KELLY, . Residence, 25 Sylvan Avenue.

TRANSITMAN AND LEVELER.

HENRY H. GLADDING, . Residence, 270 Martin Street.

DRAUGHTSMAN.

†HENRY O. CARRINGTON, . Residence, 527 Chapel Street.

SUPERINTENDENT OF SEWERS.

EDWARD DILLON, . Residence, 237 Lombard Street.

* Died January 28, 1883, before the completion of this report.

† From June, 1882.

REPORT
OF THE
CITY ENGINEER.

*To the Honorable Board of Public Works of the City of
New Haven :*

The fourteenth annual report of the City Engineer Department, of the operations during the year 1882, is hereby respectfully transmitted to your Honorable Body :

BRIDGES.

West Chapel Street Bridge.—A new and substantial iron bridge has been completed on West Chapel street, over West River. It is a single span of 99 feet and 9 inches from center to center of end pins, 100 feet and 3 inches in length over all, with roadway 22 feet wide in the clear between wheel guards, and with a sidewalk on each side 5 feet wide in the clear.

The abutments were built by the well-known contractor, Robert Redfield, from plans and specifications prepared in this office. They are of East Haven sandstone, resting on a pile and timber foundation. The abutments proper are of cut stone, pointed beds, builds and joints, and rock face, up to the bridge seats. The wing walls are built of rubble masonry at an angle of 45 degrees to the street.

The superstructure was built by the Corrugated Metal Company, of East Berlin, Conn., from detail plans and specifications prepared in this office. The trusses are pin

connected, of wrought iron throughout, 25 feet apart on centers, and 14 feet and 3 inches deep from center to center of pins. The number of panels is 7, of 14 feet and 3 inches each. The floor beams are lattice girders, 3 feet deep, placed above the lower chord and riveted to the channel bar posts by deep gusset plates. The roadway stringers are wrought iron continuous girders, 15 inches deep, riveted into the floor beams. The sidewalk stringers are creosoted Southern pine. The planking is also creosoted Southern pine, 4 inches thick on the roadway, grooved and splined, and 2 inches thick on the sidewalk, tongued and grooved.

The wearing surface is Neuchatel Asphalt Mastic ; on the roadway it is $1\frac{1}{4}$ inches thick at the gutters, and $1\frac{3}{4}$ inches thick at the center ; on the sidewalks it is 1 inch thick. The sidewalks are raised $6\frac{3}{4}$ inches above the roadway, and slope 2 inches transversely towards the gutters.

The bridge was built jointly by the City and Town, each paying one-half the expense. The cost to the City of the bridge proper, including inspecting, etc., was \$6,928.63.

Lamberton Street Bridge.—A new iron bridge is in process of construction at Lamberton street over the tracks of the New York, New Haven and Hartford Railroad Company. It is being built jointly by the City and Railroad Company, each paying one-half the expense.

The plans, specifications and working drawings were prepared in this office, both for substructure and for superstructure.

The bridge is built for five tracks, three on one side of the middle pier and two on the other, and of the full width of Lamberton street. Arthur street comes in on one side, John street on the other, and Lamberton street makes an angle of 27 deg. 52 min. with the Railroad, rendering the work somewhat complicated.

The iron work is chiefly plate girders, crossing the railroad at right angles, and resting on the pier and abutments, or on lattice girders on the street lines. The plate girders are connected by nine lines of plate and angle floor

beams, riveted into the webs of the main girders, and made continuous by deep gusset plates.

The sidewalks are raised 5 inches above the roadway, and slope 2 inches transversely. The roadway has a camber of 3 inches longitudinally. The wood work is all creosoted Southern pine. The pavement, both on roadway and sidewalks, is Neuchatel Asphalt Mastic. On the roadway it will be 2 inches thick, and on the sidewalks 1 inch thick.

Rock Lane Bridge.—Plans and estimates have been prepared for a bridge at Rock Lane, East Rock Park.

One plan is for a suspension bridge of 90 feet span, with steel cables, wrought-iron towers and stiffening trusses, and eye-bar back stays; the roadway to be 18 feet wide in the clear between wheel guards; the sidewalks 5 feet wide in the clear, with asphalt pavement on roadway and sidewalks, similar to the new West Chapel street bridge.

The second plan is for a wrought iron braced arch, 82½ feet clear span, hinged at crown and springing. The roadway to be 20 feet, and the sidewalk 5 feet wide in the clear; also with asphalt pavement.

Tomlinson's Bridge.—The matter of replacing the present dilapidated structure with a new and free bridge is being considered by a joint special committee, representing the City and Town. The work performed for this committee, and the characteristics of the proposed new bridge, are indicated by the following report:

To the Joint Special Committee on Tomlinson's Bridge:

In obedience to instructions, plans, estimates, etc., are respectfully submitted herewith, for a new iron structure for Tomlinson's Bridge.

Surveys and examinations were first made of the old foundations to ascertain if they could be utilized for the new bridge.

Drawing "A" is a section taken across the harbor on the center line of the old bridge, showing the present superstructure, the respective waterways, piers and foundations, as determined by careful soundings, and the underlying strata as determined by borings to the depth of sixty feet below the present roadway.

Considering simply the question of a bridge, regardless of the requirements of the harbor, it would be necessary to remove at least one of the present piers

to make room for a suitable pivot pier, for to put the requisite iron swing bridge on any of the present foundations would be very unwise.

Other very important considerations enter, and convince us that it would be best (when the requisite machinery is on the ground) to remove all of the old piers and their foundations. They occupy three-fifths of the sectional area between low water and the bed of the river, and more than half the area below high water. They are a serious obstruction to the natural action of the tides, as is shown conclusively by recorded government tidal observations, taken above and below the bridge during the same lunation.

The present area of waterway below low water is only .54, and below high water only .58 of the area used by Messrs. Mitchell and Whiting in fixing the harbor lines (as computed from data given in their report to the Harbor Commissioners). In order to obtain the areas used by them, it would be necessary to remove all the present piers. A study of the currents and velocities shows that it would be desirable to have an even greater area of waterway than used in Messrs. Mitchell and Whiting's calculations for harbor lines, in order to secure convenience and safety to craft passing through the bridge, and to avoid excessive scouring of the foundations in time of freshets.

The following table shows the areas of waterways and piers below average low water, and also below average high water; first with the old bridge, second with the proposed new bridge, and third as used in the computations for harbor lines:

CONDITIONS.	SECTIONAL AREAS.			
	Between Low Water and Bed of River.		Between High Water and Bed of River.	
	Waterway.	Piers.	Waterway.	Piers.
Old Bridge,.....	3,200 sq. ft.	4,800 sq. ft.	5,000 sq. ft.	6,160 sq. ft.
New Bridge,.....	6,970 "	1,020 "	9,540 "	1,410 "
Used in Computations for Harbor Lines,..	5,972 "	.....	8,697 "	.....

By removing the five old piers and their foundations, and substituting three modern cut stone piers of minimum dimensions, as per accompanying plans, we can make the new bridge *twenty-six feet shorter* between abutments than the old bridge, and obtain *more than double* the present area of water-way at low water, and nearly double at high water. Moreover the rip-rap from the old foundations is needed in widening the causeway. And with a steam grappling dredge on the ground, such rip-rap can be obtained as cheaply on the site as from the quarries.

The proposed new bridge is one foot wider and ten feet longer between abutments than the new Quinipiac Bridge at Ferry street. It consists of a two-span, iron swing bridge, 204 feet 6 inches long between centers of end sup-

ports, with channel openings on each side of 80 feet clear, and a fixed span at each end 126 feet long between centers of end pins.

The roadway is 22 feet wide in the clear between wheel guards, 23 feet 2 inches clear between trusses, with 5 feet clear sidewalks on each side. The roadway is designed for a Horse Railroad track, with carriage-way on each side. The bridge is proportioned to carry with the usual factors of safety, besides its own weight, a uniformly distributed moving load of eighty pounds per square foot of roadway and sidewalks, or a concentrated load of sixteen tons on four wheels six feet apart transversely, and eight feet apart longitudinally, placed anywhere on the roadway.

The turn-table is rim-bearing.

The swing-span swings through a complete circle, and is reversable, end for end.

Drawing "B" is a side elevation of the proposed new bridge, showing the trusses, turn-table, railing, piers, abutments, waterways, etc.

Drawing "C" is a transverse section, showing the floor system, lateral bracing, and the connection of the different members.

Drawing "D" is the strain sheet, showing the maximum stresses in each member resulting from the specified loads, and the metal designed to meet them.

Drawing "E" is a plan of the fender pier.

Drawing "F" is a profile of the center line of the roadway, from East street to the easterly end of the causeway. The black lines show the present roadway, the red lines the grade of the new bridge, and also of the approaches as they would probably be with a bridge over the railroad crossing at Water street.

A bridge at this latter point, where switching is almost constantly going on, will be needed for safety, before Tomlinson's Bridge will be used to any very great extent by the general public. This bridge is not included in the estimates.

Drawing "G" is a map of the locality. The black lines represent the present condition of things, the red lines the proposed improvements.

ESTIMATE OF COST.

Removing old structure and foundations,	.	.	.	\$18,000
New bridge, {	Substructure,	.	.	\$44,000
	Superstructure,	.	.	41,000
	Fender Pier,	.	.	3,000
				88,000
Widening causeway 13 feet, and grading,	.	.	.	17,000
				\$123,000

The widening of the causeway probably would not be absolutely needed for many years.

The dredging out of the foundations of the old bridge being necessary, chiefly for the improvement of the harbor, the question suggests itself as to

whether the general government should not bear at least a part, and the larger part, of the expense of such dredging.

For a brief history of Tomlinson's Bridge, reference is made to the Annual Report of the City Engineer for 1881.

Respectfully submitted,

CHARLES E. FOWLER, } *Engineers.*
ALBERT B. HILL, }

NEW HAVEN, CT., Dec. 20, 1882.

SEWERING.

Sewers have been constructed in fourteen streets or parts of streets, as follows :

Audubon street—from Orange street to Whitney avenue.
Daggett street—from Washington street to Congress avenue.
Dixwell avenue—from Eaton street to Henry street.
Edwards street—from State street to Nicoll street.
Foote street—from Ashmun street to Dixwell avenue.
Franklin street—from St. John street to Grand street.
Gill street—from Chapel street to Martin street.
Grove street—from Church street to Orange street.
Hamilton street—from Humphrey street to Walnut street.
Hughes place—from Greene street to St. John street.
Liberty street—from N. H. & D. R. R. crossing to Columbus avenue.
Lincoln street—from Trumbull street to Bradley street.
Summer street—at the corner of State street.
Washington street—from Howard avenue to Daggett street.

Also in the rear of the houses fronting on the easterly side of Hillhouse avenue, from Trumbull street to Sachem street.

The sizes and lengths are as follows :

24-inch Brick Sewer,	.	.	.	1115.0 feet.
15 " Pipe	"	.	.	3188 1 "
12 " " "	"	.	.	5016.9 "
Total length,				9320.0 feet, or $1\frac{765}{1000}$ miles.
Total length of Sewers in use Jan. 1, 1882,				$36\frac{503}{1000}$ "
Added in 1882,				$1\frac{765}{1000}$ "
Total length of Sewers in use Jan. 1, 1883,				$38\frac{268}{1000}$ "

The sewer for the accommodation of the residents on the easterly side of Hillhouse avenue, from Trumbull street to Sachem street, was constructed through the yards in the rear of the houses instead of in the street, thereby avoid-

ing the deep rock cutting which would have been necessary in the street, and at the same time securing more economical connections, and better grades for the house drains.

The line of the sewer passed through two buildings, in close proximity to the foundations of partition walls, rendering necessary the utmost caution in making the excavation, while several valuable fruit and ornamental trees and shrubs necessitated the building of numerous short tunnels. For these and other reasons it was decided to build the sewer by "day work" instead of by contract.

The work was very successfully executed under the direction of Assistant Engineer Ferry and Superintendent Dillon.

For details of the sewer work reference is made to the accompanying tables.

"Statement No. 1" shows the details of the work on sewers in 1882, the street and location, the contractor, the length, the size and material, the average cut, the character of the excavation, the contract price per foot, and the total cost for each sewer.

It will be noticed that the sewers built the past year have been small and mostly of vitrified pipe. No cement pipe has been used. More of the twelve inches diameter (the smallest size used here for street sewers) has been laid than of all the other sizes combined.

"Statement No. 2" is a detailed comparison of the bids for sewer work.

"Statement No. 3" shows the size, material, and length, both in feet and in miles, of all the sewers that have been constructed in the city; also the length of each size at present in use (several of the very old ones having been discontinued or rebuilt).

More fifteen inch pipe sewer is in use than of any other one size.

During the year 254 connections have been made with the sewers, and they have been in all cases inspected by some one from this Department.

PAVING.

During the year four streets or parts of streets have been paved, viz. :

Brewery street—from Water street, 319 feet southerly.

High street—from Chapel street to Crown street.

Congress avenue—from Cedar street to Daggett street, full width.

Congress avenue—from Daggett street to Bond street, 20 ft. in width.

Howard avenue—from Congress avenue to the New Haven and Derby R. R., full width.

Howard avenue—from the New Haven and Derby R. R. to the N. Y. N. H. & H. R. R., 35 feet in width.

The area of streets paved during the year is 27,698.65 square yards.

Total length of paved streets, Jan. 1st, 1882, . . . 13 $\frac{953}{1000}$ miles.

Added during 1882, ... 1 $\frac{312}{1000}$ "

Total length of paved streets, Jan. 1st, 1883, . . . 15 $\frac{265}{1000}$ miles.

The total length of the different kinds of street pavements in use at the present time is as follows :

Telford Pavement, ... 11 $\frac{445}{1000}$ miles.

Belgian " 3 $\frac{351}{1000}$ "

Concrete " 0 $\frac{308}{1000}$ "

Cobble, " 0 $\frac{161}{1000}$ "

More than twice as much pavement was laid in 1882 as in 1881.

The details of the work on pavements are given in "Statements Nos. 4 and 5."

GRADING.

The only gradings other than that done by the Superintendent of Streets, has been on the approaches to the West Chapel street and Lamberton street bridges, and is shown in "Statement No. 6."

WALKS AND CURBS.

Lines and grades for sidewalks and curbs have been given wherever ordered by the Board, or requested by property owners.

The total length given during the year amounts to 8.1 miles, three miles more than last year.

SURVEYS AND MAPS.

Under this head, the principal work accomplished during the year for the different Boards, in relation to proposed improvements, is as follows :

Maps for the Board of Public Works.

A new street—Proposed layout, from Orange to State, between Chapel and Court streets.

Brewery street—Widening and extension from Water street to Long Wharf.

Boulevard—Proposed layout of the western.

Canner street—Extension from St. Ronan street to Prospect street.

Dwight street—Proposed widening between Chapel and Martin streets.

James street and Ferry Path—Railroad crossings.

Meadow street—Widening from Congress avenue to Water street.

South Water street—Layout from Sea street to extension of Greenwich avenue.

Temple street—Widening and extension from Crown street to Congress avenue.

West River—Straightening from Martin street to Derby avenue.

Maps for the Board of Compensation for Assessing Damages and Benefits for the Opening and Widening of Streets.

Brewery street—Extension to Long Wharf and adjacent territory.

Temple street—Extension to Congress avenue and adjacent territory.

Webster street—Extension to Winchester avenue and adjacent territory.

Triangular piece, bounded by Kimberly and Greenwich avenues and Lamberton street, and adjacent territory.

Maps for the Board of Compensation for Assessing Sewers and Pavements.

Clark street sewer—State to Orange.

Congress avenue sewer—Cedar to Daggett.

Eld street sewer—State to Orange.

Elm street sewer—Kensington to Garden.

Howard avenue sewer—Derby railroad to Congress avenue.

Library street sewer—High street, westerly.

Norton street sewer—Derby avenue to Chapel.

Oak street sewer—York to Spruce.

Vernon street sewer—Congress avenue to Davenport avenue.

Wall street sewer—High street, westerly.

Water street sewer—East to Bridge.

Court street pavement—State to Orange.

Water street pavement—Bridge to Olive.

The names of the owners of the lands affected by the improvements have been furnished in all cases, and the titles to the same verified by a careful search of the land records.

For Board of Public Works, number of owners, and number of notices for hearings prepared and served,	234
For Board of Compensation for Opening and Widening Streets, number of owners furnished, ...	162
For Board of Compensation for Assessing Sewers and Pavements, number of notices for hearings prepared,	239
Total, ...	<u>635</u>

Miscellaneous work, consisting of profiles, sketches, plans, etc., for various purposes, have been furnished by this department, when requested by Boards and Committees of the Court of Common Council.

EAST ROCK PARK.

Under the direction of the East Rock Park Commissioners, all surveys, lines and grades required in the laying out of new roads, and in determining the boundaries and ownership of new lands acquired, have been made by this department, in consideration of which the Park Commission has furnished to the department the services of one man for about half the year.

STRAIGHTENING WEST RIVER.

By a joint arrangement of the City and Town, plans and specifications were prepared for the straightening of West River from Derby avenue to Martin street, and the contract for the work awarded to Solomon Mead, the lowest bidder.

The work has been satisfactorily completed. The new channel is forty feet in width. The average depth is two feet at the sides, and four feet at the center.

The following table shows the saving in length, the grades, and the computed increase of velocities due to the improvements:

	Martin Street to Chapel Street.	Chapel Street to Derby Avenue.
Length of the River by the old channel, . . .	3,100 feet	2,480 feet.
Length of the River by the new channel, . . .	980 "	1,280 "
Saving in length by the Straightening, . . .	2,120 "	1,200 "
Length of new channel required, . . .	850 "	1,180 "
Fall in River at average stage, taken at low water, just before the tide-gates shut down at Con- gress avenue, . . .	1.40 "	0.58 "
Fall in River, taken after a storm when the stage was 11 inches higher at Congress avenue, . .	1.56 "	1.10 "
Fall in River, taken at mean high water, just be- fore the tide-gates open at Congress avenue, .	0.07 "	0.06 "
Average fall in meadows, . . .	0.8 "	0.3 "
Surface of water below meadows at low water, average stage of River, . . .	1.0 "	1.6 "
Computed increase of velocity at average stage of River, due to straightening, . . .	80 per cent.	40 per cent.

The Derby avenue and the Town sewers, which now discharge into the old channel, should be extended as soon as possible to the new channel.

NUMBERING STREETS.

In accordance with the orders of the Board of Aldermen, the following thirty-one streets were numbered or re-numbered, viz.:

Bristol, Prospect, Linden, Washington, Gregson, Lyon, Greene, Alton, Exchange, Sanford, Granniss, Maltby, Downing, Bridge, Forbes place, Elliott Lane, Madison, Leonard, Pleasant, St. Ronan, Eaton, Charles, Hallock avenue, Sea, South Water, Fourth, Eddy, Hedge, Gill, York square, and Morris.

For this purpose 662 notices were prepared and served to the owners or occupants of the buildings on said streets. In addition to the above, thirty-nine buildings were numbered in different parts of the City, upon the application of individuals.

Respectfully submitted,

ALBERT B. HILL,

Assistant City Engineer.

REPORT
OF THE
SUPERINTENDENT OF STREETS.

1882.

DEPARTMENT SUPT. OF STREETS.

Office, Room No. 17, City Hall.

SUPERINTENDENT OF STREETS.

PATRICK DOYLE.

Residence, 210 Ferry Street.

CLERK.

FREDERICK H. WALDRON.

Residence, 105 Howe Street.

SUPERINTENDENT OF PARKS.

HENRY F. ANDRUSS.

Residence, 80 Chapel street.

INSPECTOR OF SIDEWALKS.

HENRY J. MATTOON.

Residence, 142 Bradley street.

REPORT
OF THE
SUPERINTENDENT OF STREETS.

To the Honorable Board of Public Works :

I have the honor to submit herewith a report of my official acts for the year ending Nov. 30, 1882 :

In the early part of the year your Honorable Board asked for and received proposals for cleaning the paved, and for repairs of the unpaved streets, by contract.

The contract was awarded to Messrs. C. W. Blakeslee & Son, commencing April 1st, 1882, since which time the contractors have done the work under my superintendence. The contractors have reported at this office daily for instructions from me. I have endeavored to keep the contractors to the terms of their contract, by daily going over the streets of the city and instructing them in their work. Thus far the contract system has worked with satisfaction. The little defects, after one year's experience, can be remedied, and I think, with the experience and remedying of these defects, that the contract system will work satisfactorily to this Board and the citizens generally.

The work of cleaning the paved streets is done by machinery, which enables the contractor to do it more quickly than formerly. The sweeping of the streets has been done in the night season. Many of the dirt streets have been turnpiked with the new road machine, owned by the contractor. Thirty-eight new crosswalks have been

constructed, and sixty-one have been relaid. In addition thereto quite a number have been repaired and partly relaid.

There have been 26,745 lineal feet, or about $5\frac{1}{8}$ miles of sidewalks and curbing completed during the past year, in accordance with thirty-five orders from the Court of Common Council. In addition thereto 754 lineal feet of walks have been repaired, and 164 repairs have been made around cellar doors, coal-holes, &c., upon solicitation of the Sidewalk Inspector.

In order to carry out the order for curbing and paving the walks on Howard avenue, south of Lamberton street, it was necessary to do considerable grading, especially between Sixth and South Water streets, where the cut was between three and four feet in depth at the deepest part, or an average of $2\frac{1}{2}$ feet, costing \$1,149.50. Wolcott street, between Poplar street and Blatchley avenue; Anderson street, between Willow and Canner streets; Canner street, between Orange and Foster streets, have also been graded in order to prepare the streets for setting curbs.

PATRICK DOYLE,

Superintendent of Streets.

DEPARTMENT OF PUBLIC WORKS—Statement No. 1.

WORK ON SEWERS IN 1882.

STREET.	Contractor.	Length.	Size and Material.	Average Cut.	Character of Excavation.	Contract Price Per Foot.	Total Cost.
Audubon, Orange to Whitney.....	L. W. Burt.....	131.	15 in. V. P.	7.3	Gravel.....	1.69	\$1,360.10
Audubon, Orange to Whitney.....	L. W. Burt.....	425.7	12 in. V. P.	8.3	Gravel.....	1.43	
Daggett, Washington to Congress.....	Michael Fitzpatrick.....	490	15 in. V. P.	12	Sand.....	1.98	3,297.42
Daggett, Washington to Congress.....	Michael Fitzpatrick.....	447.6	12 in. V. P.	11.5	Sand.....	1.75	Not
Dixwell, Eaton to Henry.....	Matthew Kehoe.....	998.9	15 in. V. P.	10.9	Sand.....	1.95	completed
Dixwell, Eaton to Henry.....	Matthew Kehoe.....	770.6	12 in. V. P.	10.4	Sand.....	1.74	
Dixwell, cor. of Foote.....	Lawrence O'Brien.....	111.	24 in. B. 8 in. I.	11.9	Sand and Loam.....	3.85	
Edwards, State to Nicoll.....	Lawrence O'Brien.....	215.3	15 in. V. P.	12.1	Sand and Gravel.....	2.48	2,064.70
Edwards, State to Nicoll.....	Lawrence O'Brien.....	335.6	12 in. V. P.	11.2	Sand and Gravel.....	1.95	
Foote, Ashmun to Dixwell.....	Lawrence O'Brien.....	1004.	24 in. B. 4 in. I.	12.3	Sand.....	2.85	4,010.62
Franklin, St. John to Grand.....	Michael Fitzpatrick.....	379.3	15 in. V. P.	12.6	Sand and Gravel.....	2.48	2,014.48
Franklin, St. John to Grand.....	Michael Fitzpatrick.....	170.6	12 in. V. P.	11.	Sand and Gravel.....	2.10	
Gill, Chapel to Martin.....	Matthew Kehoe.....	279.6	15 in. V. P.	12.1	Sand.....	2.35	1,560.48
Gill, Chapel to Martin.....	Matthew Kehoe.....	271.0	12 in. V. P.	10.4	Sand.....	1.98	
Grove, Church to Orange.....	Michael Fitzpatrick.....	50.4	15 in. V. P.	6.3	Gravel and Loam.....	2.25	1,378.35
Grove, Church to Orange.....	Michael Fitzpatrick.....	348.1	12 in. V. P.	5.4	Gravel and Loam.....	1.68	
Hamilton, Humphrey to Walnut.....	City.....	297.5	15 in. V. P.	13.	Sand and Gravel.....		1,655.73
Hamilton, Humphrey to Walnut.....	City.....	295.2	12 in. V. P.	10.7	Sand and Gravel.....		1,586.30
Hillhouse, Trumbull to Sachem.....	City.....	844.8	12 in. V. P.	10.3	Sand.....	2.38	1,127.98
Hughes, Greene to St. John.....	Lawrence O'Brien.....	26.3	15 in. V. P.	9.6	Sand.....	1.78	
Hughes, Greene to St. John.....	Lawrence O'Brien.....	330.1	12 in. V. P.	9.1	Sand.....		1,106.19
Liberly, R. R. to Columbus.....	City.....	389.4	15 in. V. P.	11.1	Sand and Gravel.....		1,319.35
Lincoln, Trumbull to Sachem.....	City.....	30.8	12 in. V. P.	10.	Sand and Gravel.....		4.00
Lincoln, Trumbull to Sachem.....	City.....	388.2	15 in. V. P.	12.	Sand.....		2,677.10
Summer, cor. of State.....	City.....	2.	15 in. V. P.				528.54
Vernon, Congress to Davenport.....	Matthew Kehoe*.....	75.	15 in. V. P.	13.4	Sand and Loam.....	1.98	245.78
Washington, cor. of Howard.....	City.....	212.	15 in. V. P.	13.5	Sand and Loam.....		
Washington, Howard to Daggett.....	Michael Fitzpatrick.....						

* Sewer built in 1881.

DEPARTMENT OF PUBLIC WORKS—Statement No. 2.

COMPARISON OF BIDS FOR SEWERS.

LOCATION.	Contractors.	24 in. Sewer, 8 in. I.	24 in. Sewer, 4 in. I.	15 in. Sewer.	12 in. Sewer.	12 in. Culverts.	Catch Basins.	Manholes.	Total Bid ac- cording to Estimates of Quantities.
Audubon st.	{ M. S. Austin.....	.....	.....	\$1.78	\$1.58	\$1.35	\$98.00	\$50.00	\$1,237.80
	{ Matthew Kehoe.....	.....	.....	1.92	1.50	1.30	98.00	52.50	1,232.80
	{ William E. Davis.....	.....	.....	1.75	1.50	1.25	110.00	55.00	1,230.00
	{ L. W. Burt*.....	.....	.....	1.69	1.43	1.25	100.00	55.00	1,182.20
Washington and Daggett sts.	{ L. W. Burt.....	.....	.....	2.44	2.08	1.30	100.00	50.00	3,630.60
	{ Lawrence O'Brien.....	.....	.....	2.45	1.90	1.20	90.00	60.00	3,620.75
	{ M. S. Austin.....	.....	.....	2.18	1.88	1.50	108.00	60.00	3,555.10
	{ William E. Davis.....	.....	.....	2.25	2.00	1.20	100.00	55.00	3,542.75
	{ Matthew Kehoe.....	.....	.....	2.10	1.80	1.45	110.00	53.00	3,411.50
	{ Michael Fitzpatrick*.....	.....	.....	1.98	1.75	1.35	103.00	55.00	3,276.00
Dixwell av.	{ William E. Davis.....	.....	.....	2.25	2.10	1.25	110.00	55.00	5,627.00
	{ L. W. Burt.....	.....	.....	2.20	1.86	1.30	100.00	50.00	5,277.20
	{ Michael Fitzpatrick.....	.....	.....	1.98	1.78	1.30	100.00	58.00	5,175.60
	{ Lawrence O'Brien.....	.....	.....	2.10	1.75	1.20	100.00	55.00	5,132.00
	{ Matthew Kehoe*.....	.....	.....	1.95	1.74	1.55	100.00	53.00	5,041.80
	{ M. S. Austin†.....	.....	.....	2.00	1.69	1.40	87.00	50.00	4,876.80
Edward st.	{ Matthew Kehoe.....	.....	.....	2.75	2.25	1.50	110.00	58.00	1,971.50
	{ William E. Davis.....	.....	.....	2.60	2.10	1.25	100.00	50.00	1,815.00
	{ Michael Fitzpatrick.....	.....	.....	2.55	2.00	1.35	98.00	57.00	1,794.00
	{ Lawrence O'Brien*.....	.....	.....	2.48	1.95	1.30	100.00	55.00	1,758.10

Foote st.	{ L. W. Burt.....	\$4.47	\$3.42	.....	.....	\$1.30	\$100.00	\$50.00	\$5,003.05
	{ William E. Davis.....	4 00	3 25	.....	.....	1.25	110 00	60.00	4,902.50
	{ Michael Fitzpatrick.....	3 98	2 98	.....	.....	1.38	103 00	60.00	4,652.10
	{ Matthew Kehoe.....	4 00	2 95	.....	.....	1.35	100 00	60.00	4,565.50
	{ M. S. Austin.....	3 30	3 00	.....	.....	1.50	99.00	60.00	4,549.50
Franklin st.	{ Lawrence O'Brien*.....	3 85	2 85	.....	.....	1.25	100.00	60.00	4,435.25
	{ Lawrence O'Brien.....	.....	.....	\$2.74	\$2.20	1.40	100.00	55.00	1,755.20
	{ Matthew Kehoe.....	.....	.....	2.60	2.20	1.50	105.00	57.00	1,718.00
	{ William E. Davis.....	.....	.....	2.60	2.19	1.50	105.00	55.00	1,708.40
	{ Michael Fitzpatrick*.....	.....	.....	2.48	2.10	1.30	98.75	55.00	1,616.15
Gill st.	{ Michael Fitzpatrick.....	.....	.....	2.45	2.05	1.70	.....	60.00	1,513.50
	{ Lawrence O'Brien.....	.....	.....	2.40	1.99	1.75	.....	58.00	1,476.30
	{ William E. Davis.....	.....	.....	2.60	1.95	1.30	.....	45.00	1,460.50
	{ Matthew Kehoe*.....	.....	.....	2.35	1.98	1.50	.....	53.00	1,442.60
	{ William E. Davis.....	.....	.....	2.45	1.80	.....	.....	48.00	908.50
Grove st.	{ Lawrence O'Brien.....	.....	.....	2.20	1.74	.....	.....	50.00	882.20
	{ Matthew Kehoe.....	.....	.....	2.50	1.75	.....	.....	42.00	870.50
	{ Michael Fitzpatrick*.....	.....	.....	2.25	1.68	.....	.....	45.00	846.90
	{ William E. Davis.....	.....	.....	2.55	2.00	1.50	100 00	50.00	1,141.50
	{ Lawrence O'Brien.....	.....	.....	2.45	1.95	1.48	100.00	53.00	1,124.50
Hughes pl.	{ Matthew Kehoe.....	.....	.....	2.50	1.90	1.45	105.00	47.00	1,117.50
	{ Michael Fitzpatrick*.....	.....	.....	2.88	1.78	1.30	98.00	49.00	1,049.00

* Awarded the Contract.

† Bid was informal.

DEPARTMENT OF PUBLIC WORKS—Statement No. 3.

SEWERS BUILT AND SEWERS IN USE.

Size and Material.	Length of Sewers Constructed.		Length of Sewers in Use.	
	Feet.	Miles.	Feet.	Miles.
74 in. Brick and Stone.....	731.	.138	731.	.138
72 in. Brick.....	940.3	.178	940.3	.178
67.6 in. Brick and Stone.....	1021.5	.193	1021.5	.193
66 in. Brick.....	2638.7	.5	2638.7	.5
63.3 in. Brick and Stone.....	1526.2	.289	1526.2	.289
60 in. Brick.....	3546.3	.672	3546.3	.672
57 in. Brick.....	710.	.134	350.	.066
54 in. Brick.....	11756.4	2.226	11756.4	2.226
48 in. Brick.....	4050.4	.767	4050.4	.767
45 in. Brick.....	199.8	.038	199.8	.038
42 in. Brick.....	7062.	1.338	7062.	1.338
36 in. Brick.....	13603.3	2.576	13585.3	2.573
30 in. Brick.....	17438.5	3.303	17438.5	3.303
24 in. Brick.....	28258.3	5.352	28258.3	5.352
24 in. Cement Pipe.....	22194.4	4.204	18383.9	3.482
20 in. Brick.....	127.5	.024	127.5	.024
18 in. Cement Pipe.....	23036.	4.363	21281.1	4.030
15 in. Cement Pipe.....	27901.3	5.284	27515.3	5.211
15 in. Vitrified Pipe.....	12421.7	2.353	12421.7	2.353
12 in. Cement Pipe.....	16256.2	3.079	16108.2	3.051
12 in. Vitrified Pipe.....	10825.3	2.050	10825.3	2.050
12 in. Brick.....	870.	.165	870.	.165
Unknown.....	2110.	.4	1418.7	.269
Total.....	209225.1	39.626	202056.4	38.268
	202056.4	38.268		
Amount destroyed.....	7168.7	1.358		

DEPARTMENT OF PUBLIC WORKS—Statement No. 4.

SHOWING STREETS PAVED DURING 1882.

STREET.	Location.	Contractor.	Kinds of Pavement.	Length in Feet.	Number of Square Yards.	Cost per Square Yard.	Total Cost.
Brewery.....	Water street, southerly.....	G. Pohlman	Belgian...	319	851.2	\$1.39	\$1,183.17
Congress avenue...	Cedar to Bond.....	C. W. Blakeslee & Son.	Telford. .	2,890	9,625.24	1.01	9,721.49
High	Chapel to Crown.....	J. H. Connor	Telford...	474	1,260.24	1.03	1,308.05
Howard avenue...	Congress to Kimberly avenue	R. Connor.....	Telford...	3,244	15,961.7	.60	9,577.02

DEPARTMENT OF PUBLIC WORKS—Statement No. 5.
SHOWING REPAIRS ON PAVEMENTS DURING 1882.

LOCATION.	Between what Points.	Kind of Pavement.	Work Done.	Cost.
Crown street.....	.....	Telford.....	Repairs and Top Dressing..	\$17.00
Church street.....	Chapel to George street.....	Telford & Belgian	.....	501.72
Congress avenue.....	George to Cedar street.....	Telford.....	Repairs and Top Dressing.	187.99
Chapel street.....	Church to State street.....	Telford.....	Repairs.....	93.94
Chapel street.....	West of York street.....	Telford.....	Top Dressed.....	137.50
Center street.....	Orange to Temple street.....	Concrete.....	Top Dressed.....	417.69
Elm street.....	.....	Telford.....	Top Dressed.....	578.00
George street.....	.....	.....	Repairs Gutters.....	23.28
Hillhouse avenue.....	Trumbull to Sachem street.....	Concrete.....	Top Dressed.....	190.00
Orange street.....	.....	Telford.....	Top Dressed.....	85.68
State street.....	.....	Telford.....	Hardening.....	3,122.08
State street.....	.....	Telford.....	Repairs and Top Dressed..	57.00
St. John street.....	.....	Telford.....	Repairs and Top Dressed..	42.00
Union avenue.....	State to Meadow street.....	Telford.....	Repairs and Top Dressed..	5.00
Wooster street.....	.....	Telford.....	Repairs and Top Dressed..	99.00
Whalley avenue.....	.....	Telford.....	Repairs and Top Dressed..	298.00
York street.....	.....	Telford.....	Repairs and Top Dressed..	60.66

DEPARTMENT OF PUBLIC WORKS—Statement No. 6.
SHOWING STREETS GRADED AND TURNPIKED DURING 1882.

STREET OR AVENUE.	Between What Points.	Contractor.	Cubic Yards.	Length in Feet.	Total Cost.
Anderson street.....	.....	City.....	.....	420	\$427.25
Brewery street.....	South of Water street.....	Blakeslee and others...	894	450	622.65
Chapel street (east).....	.....	(Shelling) City.....	.....	.....	5.40
Chapel street (west).....	Approach to Bridge street.....	.....	.....	.....	26.25
Commerce street.....	.....	C. W. Blakeslee & Son.	163	.....	24.45
Canner street.....	.....	City.....	.....	.....	387.00
Chestnut street.....	Green to Chapel street.....	C. W. Blakeslee.....	.....	650	129.75
Exchange street.....	.....	(Shelling) City.....	.....	.....	5.40
Eagle street.....	Nicoll to Nash street.....	City.....	.....	260	88.50
Goffe street.....	.....	.....	.....	.....	38.00
Grand street (east).....	.....	(Shelling) City.....	.....	.....	3.60
Howard avenue.....	.....	(Shelling) City.....	.....	.....	93.65
Howard avenue.....	Lamberton to South Water street.....	City.....	.....	3,680	1,149.50
Hill street.....	.....	.....	.....	.....	34.20
Kimberly avenue.....	.....	(Shelling) City.....	.....	.....	66.00
Lloyd street.....	Chapel to River street.....	P. Mulholland and City.....	391	300	382.46
Meadow street.....	.....	C. W. Blakeslee & Son.....	.....	.....	58.65
Montroe street.....	.....	.....	.....	149.00	149.00
Mill River street.....	.....	.....	.....	.....	5.00
Mechanic street.....	.....	.....	.....	.....	39.00
North avenue.....	.....	.....	.....	.....	11.25
Oak street.....	.....	.....	.....	.....	24.86
Osborn street.....	.....	.....	.....	.....	15.80
Porter street.....	.....	.....	.....	.....	72.75
Portsea street.....	.....	.....	642	.....	182.70
Pearl street (east).....	.....	(Shelling) City.....	.....	.....	12.60
Peck street.....	.....	.....	.....	.....	35.72
Pierpont street.....	.....	(Shelling) City.....	.....	.....	21.00

DEPARTMENT OF PUBLIC WORKS—Statement No. 6.—(Continued.)
SHOWING STREETS GRADED AND TURNPIKED DURING 1882.

STREET OR AVENUE.	Between What Points.	Contractor.	Cubic Yards.	Length in Feet.	Total Cost.
Second street (F. H.)	.....	(Shelling) City	.....	.....	\$23.40
Whalley avenue	.....	.....	.....	.....	50.75
Water street	near Meadow street	.....	.....	.....	73.50
Willow street	.....	.....	.....	.....	75.00
Winthrop avenue	Sylvan to Davenport avenue	City	.....	1,350	76.75
Walnut street	.....	.....	.....	.....	60.25
Whiting street	.....	.....	.....	.....	45.00
Wolcott street	Blatchley avenue to Poplar street	.....	.....	.....	84.50

DEPARTMENT OF PUBLIC WORKS—Statement No. 7.

SHOWING WORK ON BRIDGES DURING 1882.

NAME.	Location.	Work Done.	Cost.
Barnesville	Mill River	Repairs	\$29.67
Dragon	Quinnipiac River	Repairs	233.40
Chapel street ..	West River	Half Expense, new	7,087.13
Chapel street ..	Mill River	Repairs, Filling, etc.	\$522.94
Chapel street ..	Mill River	Salary, Tender	720.00
Congress avenue ..	West River	One-half Bill Painting	1,242.94
Kimberly avenue ..	West River	Repairs	35.50
Lewis	Mill River	One-half Bill Painting	1.75
Lamberton street ..	Railroad Tracks	One-half Expense, new	45.00
Martin street ...	West River	One-half Expense Replanking	14,450.24
Orange street ..	Mill River	One-half Expense Replanking	235.99
Quinnipiac	Quinnipiac River	One-half Bill Repairs	21.75
State street	Mill River	One-half Bill Tender	1,297.45
State street ...	Mill River	Repairs	400.00
Whalley avenue ..	West River	Repairs	13.56
			21.10

DEPARTMENT OF PUBLIC WORKS—Statement No. 8.
SHOWING OPENINGS OF DRAW BRIDGES DURING 1882.

MONTH.	QUINNIPAC BRIDGE.						CHAPEL STREET BRIDGE.						
	Steamers.	Schooners	Sloops.	Sharpies.	Misc.	Total.	Tugs.	Barges.	Schooners	Sloops.	Scows.	Sharpies.	Total.
1881. December...	201	44	4	168	.....	417	224	89	29	2	14	8	366
1882. January.....	186	43	.....	56	.....	285	106	44	13	.....	8	.....	171
“ February ...	205	42	.....	47	.....	294	122	44	15	.....	9	.....	190
“ March.....	190	61	10	187	.....	448	128	44	16	.....	15	.....	203
“ April.....	220	43	10	355	2	630	179	85	19	8	25	.....	316
“ May.....	270	17	20	220	.....	527	179	73	18	7	20	.....	297
“ June.....	130	10	17	126	.....	283	216	93	11	9	18	.....	347
“ July.....	13	3	7	5	.....	28	238	85	18	9	33	.....	383
“ August.....	225	15	21	330	.....	591	299	115	26	5	12	.....	457
“ September ..	187	10	15	240	.....	452	247	83	18	6	40	.....	394
“ October ...	184	10	16	258	.....	468	203	85	23	5	11	.....	327
“ November...	205	47	13	139	.....	404	198	70	25	2	15	.....	310
Total.....	2216	345	133	2131	2	4827	2339	910	231	53	220	8	3761

DEPARTMENT OF PUBLIC WORKS—Statement No. 9.

SHOWING NEW CROSSWALKS CONSTRUCTED DURING 1882.

STREET.	LOCATION.	SIDE.
Bristol.....	Across Ashmun.....	North.
Baldwin.....	" Davenport ave.....	West.
Chapel.....	" State.....	South.
Chapel.....	Between Orange and Church.....	
Chapel.....	" State and Orange.....	
Clay.....	Across Poplar.....	North.
Edward.....	" Orange.....	"
Edward.....	" Livingston.....	"
Elliott.....	" George.....	East.
Ferry.....	" Chatham.....	"
Ferry.....	" Limerick.....	"
Fillmore.....	" Pine.....	"
Fillmore.....	" ".....	West.
Fillmore.....	" Clay.....	East.
Fillmore.....	" ".....	West.
Grand.....	" Bright.....	North.
Jefferson.....	" Grand.....	East.
Kimberly ave....	" Lamberton.....	West.
Kimberly ave....	" First.....	"
Kimberly ave....	" Second.....	"
Kimberly ave....	" Third.....	"
Kimberly ave....	" Fourth.....	"
Kimberly ave....	" Fifth.....	"
Kimberly ave....	" Sixth.....	"
Kimberly ave....	" Sea.....	"
Lewis.....	" Pine.....	"
Linwood.....	" Martin.....	East.
Minor.....	" Liberty.....	North.
Orchard.....	" Sylvan ave.....	West.
Pierpont.....	" Ferry.....	North.
Poplar.....	" Pine.....	East.
Poplar.....	" Clay.....	"
Perkins.....	" Pine.....	"
Pine.....	" Poplar.....	South.
Wallace.....	Between Chapel and Green.....	
Whalley ave....	Opposite County Jail.....	
Walnut.....	Across Mill River st.....	North.
Whiting.....	" Commerce.....	"

DEPARTMENT OF PUBLIC WORKS—Statement No. 10.

SHOWING SIDEWALKS COMPLETED DURING 1882.

STREET.	Between what Points.	Side.	Material.
Anderson	Canner to Willow street	Both.	Curb and Grade
Ashmun	Henry to Gregory street	West.	Brick.
Bradley	Grand street to Railroad Bridge ..	West.	Relay.
Broad	George to 14 Broad street	East.	Relay.
Cedar	R. R. Bridge to Columbus avenue ..	East.	Brick.
Cedar	Broad street to Congress avenue ..	East.	Brick.
Chestnut	Greene street to St. John street ..	East.	Brick.
Chestnut	Chapel to Greene street	West.	Brick.
College	Elm to Wall street	West.	Relay.
Collis	No. 13 to No. 29	North.	Relay.
Chapel	Park to Dwight street	North.	Relay.
Eagle	Nicoll to Nash street	Both.	Curb and Grade
Elliott	George street to Gilbert avenue ..	East.	Brick.
Elm	Beers street to Sherman avenue ..	South.	Concrete.
Ferry	Peck street to Middletown avenue ..	East.	Graded.
Fillmore	Grand street to Shore Line R. R. ..	Both.	Concrete.
Greene	Chestnut to East street	North.	Relay.
Gregson	Center to Crown street	West.	Brick.
Howard avenue ..	Kimberly ave. to South Water st. ..	West.	Concrete.
Howard avenue ..	Congress ave. to Washington st. ..	West.	Relay.
Jefferson	Grand to St. John street	West.	Relay.
Lawrence	Whitney avenue to St. Ronan st. ..	Both.	Curb and Grade
Lock	Ashmun to Canal street	South.	Curb and Grade
Martin	Beers street to Sherman avenue ..	North.	Curb and Grade
Monroe	Clay to Lombard street	East.	Curb and Grade
Monroe	Lombard to Jackson street	West.	Curb and Grade
Olive	St. John to Grand street	West.	Relay.
Orchard	Oak to Sylvan avenue	West.	Brick.
Orange	Cottage to Willow street	East.	Curb and Grade
State	No. 681 to No. 691	Both.	Relay.
Trumbull	Lincoln street to Whitney avenue ..	South.	Relay.
Wallace	Wooster to Water street	Both.	Relay.
Whalley avenue ..	Norton to Pendleton street	South.	Curb and Grade
Whiting	Hill to Meadow street	North.	Brick.
Wolcott	Poplar street to Blatchley avenue ..	South.	Concrete.

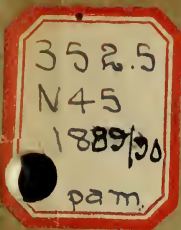
DEPARTMENT OF PUBLIC WORKS—Statement No. 11.

SHOWING AMOUNT EXPENDED DURING 1882.

Bridges, ...	\$25,185.40
Department of Superintendent of Streets, ...	3,500.00
City Engineer's Department, ...	7,493.85
Cleaning Sewers and Drainage, ...	9,600.10
Contingent Expenses, ...	2,887.20
Crosswalks and Cobble Gutters, ...	6,999.99
General Repairs and Turnpiking Streets, ...	17,706.09
Grading Streets, ...	3,757.06
Opening and Widening Streets, ...	4,681.75
Ordinary Labor, ...	5,793.91
Paving Streets, ...	24,926.24
Parks and Trees, ...	6,290.09
Road Roller, ...	608.53
Stone Crusher, ...	11,903.26
Sewers, ...	35,195.11
Walks and Curbs, ...	2,111.45
East Rock Park, ...	30,271.40
West River Straightening, ...	819.92
Total, ...	\$199,731.35

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ANNUAL REPORTS

OF THE

DEPARTMENT

OF THE

BOARD OF PUBLIC WORKS

CITY OF NEW HAVEN, CONN.

FOR THE YEAR 1890.

NEW HAVEN, CONN.:
PRESS OF O. A. DORMAN, 696 CHAPEL STREET.
1891.

ANNUAL REPORTS
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CITY OF NEW HAVEN, CONN.
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NEW HAVEN, CONN.:
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1891.

3585
W47
1887/30

BOARD OF PUBLIC WORKS.

1890.

CHAIRMAN.

HON. HENRY F. PECK, Mayor, *ex-officio*.

JAMES N. STATES, *President*.

Term expires first Monday of Feb., 1893. Residence, 230 Howard Ave.

JAMES REILLY.

Term expires first Monday of Feb., 1891. Residence, 21 Bradley Street.

THERON A. TODD.

Term expires first Monday of Feb., 1891. Residence, 62 Whalley Ave.

ELI WHITNEY, JR.

Residence, Whitney Avenue, cor. Cliff Street.

Term expires first Monday of February, 1892.

WALTER LEIGH.

Term expires first Monday of Feb., 1892. Residence, 312 Orange Street.

WILLIAM J. ATWATER.

Term expires first Monday of Feb., 1893. Residence, 19 Trumbull Street.

SUPERINTENDENT OF STREETS.

PATRICK KENT.

Residence, 376 Blatchley Avenue.

CLERK.

FREDERICK H. WALDRON.

Office, No. 17½ City Hall.

Residence, 105 Howe Street.

CITY ENGINEER.

ALBERT B. HILL.

Residence, 176 York Street.

Regular meeting on Wednesday, preceding the first Thursday of each month, at office, No. 17 City Hall, at 7:30 p. m.

REPORT

OF THE

BOARD OF PUBLIC WORKS.

To the Honorable Court of Common Council:

I have the honor to transmit herewith the report of the Board of Public Works for the year ending November 30th, 1890, with accompanying statements, etc., as a part of the report.

The board has held forty meetings at their office during the year. Seventy-six (76) orders and other papers have been transmitted during the year from your honorable body for consideration and execution, as follows :

For constructing sewers, ...	25
For walks and curbs, ...	16
For grading, ...	4
For crosswalks, ...	12
For hardening streets with stone, ...	7
For street layouts, ...	4
Miscellaneous papers, ...	8
Total, ...	<u>76</u>

Forty-nine (49) contracts were awarded by the board as follows:

For constructing sewers, ...	30
For cobble gutters, ...	9
For new bridges, ...	1
For crushed stone, ...	1
For sewer castings, ...	1
For Belgian blocks, ...	1
For granite basin heads, ...	1
For cobble stones, ...	1
For blue stone, ...	1
For vitrified pipe, ...	1
For new well and pump, ...	1
For concrete walks, ...	1
Total, ...	<u>49</u>

✓ 2079

SEWERS.

Sewers have been constructed in the whole or portions of forty-two (42) streets and avenues, as follows :

Admiral street,	Lock street,
Argyle street,	Mechanic street,
Ashmun street,	Mill River street,
Avon street,	Minor street,
Beach street,	Newhall street,
Canner street,	Nicoll street,
Carlisle street,	Oak street,
Cedar street,	Orchard street,
Congress avenue,	Park street,
Cottage street,	Prince street,
Dow street,	Putnam street,
Dwight street,	Rosette street,
Eagle street,	Temple street,
Elm street,	Vernon street,
Ferry street,	Ward street,
Foster street,	Webster street,
Haven street,	Winchester avenue,
Hazel street,	Wolcott street,
Howard avenue,	York square,
Liberty street,	York street,
Livingston street,	Wall street.

The total length of these sewers is six and thirty-four one-hundredths ($6\frac{34}{100}$) miles. Some were to replace sewers which were unfit for further service. The net increase during 1890 is five and eight hundred and thirty-seven one thousandths ($5\frac{837}{1000}$) miles, making a total length of sixty-four and one quarter ($64\frac{1}{4}$) miles of sewers now in use.

Nearly one-half of the sewers of the City are now completed. Most of the large and expensive sewers finished and in use.

Statements No. 1 to No. 6 submitted herewith show the work and expenditures in detail.

BRIDGES.

Quite extensive repairs have been made on some of the bridges.

New automatic gates have been erected on Quinnipiac Bridge under the supervision of the City Engineer. This bridge has also been thoroughly repainted and otherwise repaired.

The new bridge over Mill river at Rock lane connecting Whitney avenue with the Farnam drive in East Rock Park was completed early in the year. The total cost of this structure to the city was \$11,109 50. A detailed statement is shown by the accompanying statement No. 10 of all work done on bridges.

PAVING AND HARDENING STREETS.

No new pavements were laid during the year.

The whole or portions of the following streets were hardened with crushed stone in accordance with orders from your honorable body :

Bradley street,	Orange street,
Daggett street,	South street,
George street,	Temple street.
Howard avenue,	

The average cost of this work has been forty-one and one-quarter ($41\frac{1}{4}$) cents per square yard. Details are shown by statement No. 7 and repairs of pavements and street hardenings by statement No. 9.

STONE CRUSHER.

Early in the year a contract was entered into with Connor Brothers & Co. for furnishing crushed stone delivered on the streets at one dollar and twenty-five (\$1.25) cents per ton.

An appraisal was made of the entire plant including buildings, engine, crushers, tools, etc., and the works turned over to the contractors for one year, that being the length of the contract.

Upon the termination of the contract a re-appraisal will be made of all the property and the works turned back to the City in as good condition as when taken. In case of any depreciation in value the contractor shall make such repairs

as the appraisers may specify, or shall pay in cash the difference between the value of the plant as indicated by the two appraisers, and each party to the contract to pay one-half of the expense of the inventory and appraisal.

Under this contract $17,589\frac{195}{2000}$ tons of stone were delivered upon the streets of the City. The price paid was less per ton by contract than the previous cost when done by the City, as will be seen by the table prepared and submitted in the report of 1889.

PUBLIC PARKS.

The amounts expended on the parks and trees by the board during the year 1890 was as follows:

Superintendent and labor,	\$3,642.39	
Carting,	312.00	
Cutting grass,	388.80	
Mowing machines, tools, etc ,	322.81	
Repairs, pumps, etc ,	72.49	
Oil and paint,	19.82	
Fertilizers,	12.47	
Tree boxes,	33.89	
		\$4,804.67

OLD STATE HOUSE SITE.

Labor,	\$461.14	
Carting,	397.30	
Turf,	109.45	
Seed,	46.20	
Repairs walks,	357.78	
		\$1,371.87

MUNSON PARK.

Repairs fence,	\$13.42	
Repairs walk,	27.32	
		\$40.74

TROWBRIDGE SQUARE.

Repairs walks,	\$16.00
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HAMILTON SQUARE.

Repairs fence,	\$22.50
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Total,		\$6,255.78
--------	-------	------------

Thirty-nine new crosswalks have been laid during the year.

One thousand seven hundred and thirty-nine permits have been issued for excavating in streets, as follows : 1006 for making connections with water and gas mains ; 601 for making connections with public sewers ; 133 for miscellaneous purposes such as setting poles, repairs horse railroad tracks, steam pipes, etc.

The amount paid for these permits is \$1,101.50 which has been turned over to the tax collector.

The following amounts were also received and turned over to the City Treasurer.

For discharge of liens, ...	\$97.80
For cobble gutters, ...	1,663.62
For moving snow, ...	306.64
For crosswalks, ...	38.55
For cutting grass, ...	21.00
For sales of materials, ...	87.85
For trimming trees, ...	17.25
For walks and curbs, ...	51.37
For sewer connection, ...	11.50
	\$2,295.58

Sixty-nine orders for walks, curbs, repairs, etc., were completed during the year, as per accompanying table No. 12.

Respectfully submitted in behalf of the board,

FRED. H. WALDRON, *Clerk.*

REPORT
OF THE
CITY ENGINEER.

1890.

CITY ENGINEER'S DEPARTMENT.

1890.

CITY ENGINEER.

ALBERT B. HILL, Residence, 176 York Street.

FIRST ASSISTANT ENGINEER, IN SPECIAL CHARGE OF SEWER WORK.

CHARLES A. FERRY, Residence, 104 Liberty Street.

ASSISTANT ENGINEER, IN CHARGE OF STREET WORK.

CASSIUS W. KELLY, Residence, 209 Norton Street.

TRANSITMEN.

BOYNTON W. MCFARLAND, Until October 1st.

HENRY H. GLADDING, Since October 1st.

LEVELERS.

HENRY L. DAVIS,

*WALDO C. BRIGGS, From July 1st to October 1st.

*EDWARD G. WILLIAMS, Since November 1st.

SUPERINTENDENT OF SEWERS.

EDWARD DILLON, Residence, 237 Lombard Street.

City Engineer's Office : No. 17 City Hall.

Assistant Engineer's Office and Draughting Room : No. 18 City Hall.

* On account of New Haven Commission of Public Parks.

REPORT

OF THE

CITY ENGINEER.

*To the Honorable, The Board of Public Works, of the
City of New Haven:*

The City Engineer respectfully submits the twenty-second annual report of the department, and for the year 1890.

BRIDGES.

The superstructure of the Rock Lane Bridge over Mill river, was completed early in the season. It is a three hinged arch bridge 84 feet 4 inches span from center to center of end pins, and 14 feet 3 inches in rise. The arches are 22 feet apart on centers. The depth of the arches at the springing is 20 inches, at one-third the distance from the springing to crown 21 inches. at two-thirds the distance 19½ inches, and at the crown 16 inches. The pin-hinges are 4⅞ inches in diameter. There are eleven panels of 7 feet 8 inches. All the metal work is of mild steel excepting the end shoes which are cast-iron, the web of the sidewalk railing which is wrought iron, and the cornice which is galvanized iron. The roadway is 20 feet wide in the clear, cambered 6 inches longitudinally and 3 inches transversely. The sidewalks on each side are 6 feet wide in the clear, with a slope of 1½ inches to the curb. The curb is 4 inches above the roadway gutter. The roadway has a double under floor, consisting of two courses of North Carolina pine creosoted with 15 pounds of oil per cubic foot of lumber; the bottom course 4 inches thick, laid longitudinally directly on the steel floor beams; the top course 3 inches thick, laid transversely and spiked to

the bottom course. The wearing surface on the roadway is 2½ inches of sheet asphalt.

The sidewalks have also a double creosoted under floor. The bottom course 3 inches thick laid longitudinally and spiked to spiking pieces bolted on the floor beams; the top course 1½ inches thick laid transversely and covered with 1½ inches of asphalt.

The bridge is proportioned to carry, with safety, besides its own weight, a load of 100 pounds per square foot of roadway and sidewalks, coming on from either end, until the whole bridge is covered, or a concentrated load of 12 tons on four wheels 6 feet apart transversely and 8 feet apart longitudinally placed anywhere on the roadway.

Mr. Eli Whitney became responsible for the cost of that portion of the bridge outside the City limits.

The substructure work was all completed last year.

The cost of the City portion was,	\$5,827.60
The portion outside the City was,	1,449.82
Total cost of substructure,	<u>\$7,277.42</u>
The cost of the superstructure was,	\$5,374.90
Of which the City paid,	5,281.90
And Mr. Whitney,	93.00
The cost of the superstructure per square foot was,	1.97
The total cost of the bridge was,	\$12,652.32
Of which the City paid,	11,109.50
And Mr. Whitney,	1,542.82

The State street and Grand avenue bridges over Mill river and the Quinniapiac bridge have been repaired, and several of the wooden bridges have been replanked and otherwise repaired. The details of cost will be found in "Department of Public Works Statement Number 10."

The Grand avenue bridge over the Quinniapiac river is subjected to heavy traffic; the cost of keeping the woodwork in repair capitalized at four per cent would be more than sufficient to replace it with a plate girder bridge with granite wearing surface, similar to the Mill river bridges at State street and Grand avenue. The floor beams are beginning to show signs of weakness, and the bridge will need

to be retimbered next year. If a sufficient appropriation could be obtained, it would be true economy to replace the present structure with steel girders and a granite roadway. It could be so designed and erected as not to obstruct traffic.

Guard gates have been placed on the Quinnipiac bridge. There are eight gates in all, double gates on the roadway at each end of the draw, and a single gate on each sidewalk. They are wrought-iron throughout; the frames are light channel bars, and the pickets wrought-iron tubes; they swing horizontally on vertical shafts, shutting in all cases against the traffic, and opening in all cases away from the waiting public. They are all connected together, and operated at once by the draw tender at the center of the draw. The mechanism is so designed that the draw cannot be swung until the gates are shut, and the gates cannot be opened until the draw comes back to place and is latched. The latching of the draw unlocks the gates. The gates are shut and latched by the bridge tender at the center of the draw swinging a lever through half a revolution, and requires less than five seconds. By tripping the latches by a foot lever from the center of the draw, the gates swing open by counter weights in about the same time.

All the mechanism for working the gates excepting the the lever at the center of the draw, is beneath the floor and out of the way. The connections between the draw span, and fixed spans are broken automatically when the draw moves off, and re-established when it returns to place; and work equally well whether or not the draw is reversed end for end.

Allowance is made for variations and irregularities in swinging the bridge, of one inch longitudinally, three inches vertically and six inches in alignment. The principal connections are made adjustable.

The work was erected by the Audubon Machine Works, Mr. Gustave D. Twiss, one of their machinists, having special charge of the erection.

A gong has been placed on the draw to be sounded before the gates are closed, as a warning to traffic to stop. Lights are also put on the gates at night. When the gates are closed red lights show down the center of the roadway. When the gates are open, the bridge ready for traffic and closed to vessels, the danger lights show up and down the river.

SEWERS.

Sewers have been constructed in forty-one different streets, or parts of streets, as shown in the appended "Statement No. 1."

The length of sewers built during 1890 is a little over six miles, and exceeds the amount constructed in any previous year excepting in 1872 and 1873.

They were all built by the advertised contract system, excepting branches into Hazel and into Eagle streets, and Temple street from Elm to Grove streets. The latter was the replacing of an old cement pipe sewer by vitrified pipe. This work was done by the City by day work under the personal charge of the Superintendent of Sewers, Mr. Edward Dillon.

The contracts in every case were awarded to the lowest bidder.

All sewers from nine inches to eighteen inches were of salt-glazed vitrified pipes, and all above eighteen inches diameter of hard burned bricks laid in hydraulic cement.

The sizes and lengths constructed during the year 1890 are as follows :

48-inch brick,	1,149.3 feet.
42-inch brick,	1,764.5 feet.
36-inch brick,	555.7 feet.
30-inch brick,	327.6 feet.
24-inch brick,	4,658.8 feet.
18-inch vitrified pipe,	3,606.7 feet.
15-inch vitrified pipe,	9,643.2 feet.
12-inch vitrified pipe,	9,644.5 feet.
9-inch vitrified pipe,	507.2 feet.

Total, 31,857.5 feet = $6\frac{34}{1000}$ miles.

Length of sewers in use Jan. 1, 1890 = $58\frac{413}{1000}$ miles.

Length of sewers in use Jan. 1, 1891 = $64\frac{250}{1000}$ miles.

The foundation for the Boulevard sewer from Congress avenue to Oak street, has been put in. The contract for the masonry should be let in the Spring in order that it may be finished and the cement set hard before freezing weather in the Fall. Then in the Fall the foundation put in for the next section from Oak street to Derby avenue, and the succeeding Spring the masonry built. This extension will cut off all the sewage now discharging into West river. Extensions beyond Derby avenue will not be needed for many years.

For details of sewer work reference is made to the appended tables:

Statement No. 1 shows the street and location, the contractor, the length, the size and material, the average cut, the contract price per foot, and the total cost of each sewer constructed in 1890.

Statement No. 2 is a summary of the sewers constructed in 1890, classified as to size and length. The amounts of 12-inch and 15-inch pipe are nearly identical, and constitute nearly two-thirds of the entire length laid during the year.

Statement No. 3 gives the size, material, and length in feet and in miles of all sewers constructed in the City; also of all those at present in use. Notwithstanding the large amount of pipe sewer constructed during the past two years, the greatest length is still 24-inch brick.

Statement No. 4 gives the old sewers discontinued during the year, the net increase, and the total length.

Statement No. 5 shows the average contract price per foot for each size of sewer constructed in 1890, obtained by dividing the total cost of each size by the total length. The prices average lower than last year.

Statement No. 6 shows in detail the bids for sewer work in 1890.

The total of the highest bids,	\$137,340.70
The total of the lowest bids,	113,700.70
Difference,	<u>\$23,640.45</u>

The competition was closer than last year.

The number of house connections made with sewers during the past year was 631. This is six per cent more than last year, and last year it was sixty-eight per cent more than the previous year. This continued increase in the number of connections with the public sewers shows the appreciation by our citizens of good sewerage facilities. In each case the connection with the street sewer was inspected by some one from this department, and the location of the private drain, at the sewer, and at the fence or curb line, noted and plotted on the maps; so that it can be found at any time if desired.

The enclosed report of the Superintendent of Sewers shows that the cost of cleaning sewers the past year averaged \$30.81 per mile of the sewers in use January 1, 1890. This is about sixteen per cent. more than last year.

The cost of cleaning basins has averaged \$1.40 for cleaning each basin once. This is about three per cent. less than last year.

REPORT OF SUPERINTENDENT OF SEWERS.

To A. B. Hill, City Engineer:

I herewith submit the following report of the work of my department for the year.

SEWERS CONSTRUCTED BY DAY WORK.

This has been the building of the Temple street sewer from Elm street to Grove street: 515 feet of 18-inch sewer, 382 feet of 15-inch sewer, 4 feet of 12-inch sewer, seven manholes, three catch basins, and 70 feet of 10-inch culvert.

Corner of Eagle and Mechanic streets: 29.8 feet of 18-inch sewer, one manhole, two catch basins, and 31 feet of 10-inch culvert.

Also the building of eleven catch basins.

REPAIRS OF SEWERS.

The only work done under this head has been the building of 5 manholes on the Wall street sewer; the rebuilding of a catch-basin corner of Humphrey and Pleasant streets; also the rebuilding of eight receiving basins, and the relaying of 195 feet of 12-inch pipe culvert.

The cost of repairs on sewers, basins, surface drainage culverts, etc., has been \$867.20.

All the sewers are in good condition with the exception of the Laurel street overflow.

CLEANING SEWERS.

The usual amount of cleaning and flushing of sewers and culverts has been done.

The cost of cleaning brick sewers was	.	.	.	\$567.56
The cost of flushing pipe sewers was	.	.	.	\$1,232.00
The cost of flushing pipe culverts was	.	.	.	\$304.90

The cost of cleaning the sewers averaged \$30.81 per mile of sewers in use January 1, 1890.

CLEANING BASINS.

Two thousand and ninety-eight catch basins have been cleaned during the year at a total cost of \$2,937.20, an average of \$1.40 for cleaning once.

	New Style.	Old Style.	Receiver.
Basins built during the year, ...	114	....	2
Basins discontinued during the year, . . . .	....	4	5
Net increase, ...	114	....	....
Net decrease, . . . . .	....	4	3
Basins in use January 1, 1890, ...	1,023	78	318
Basins in use January 1, 1891, ...	1,137	74	315

Pipe used on day work during 1890—18-inch, 681 feet; 15-inch, 443 feet; 12-inch, 454 feet; 10-inch, 785 feet; 9-inch, 46 feet, and 6-inch, 76 feet.

Respectfully submitted,

EDWARD DILLON,

Superintendent of Sewers.

PAVING.

No new granite or Telford pavement was laid, but seven streets, or parts of streets (the same number of last year, and also the year before) were paved with 6-inch McAdam, under the charge of the Superintendent of Streets.

The total length of streets thus treated in 1890 amounts to $1\frac{590}{1000}$ miles, and the area to 41,618 square yards. The average cost was $41\frac{1}{4}$ cents per square yard, or about 24 per cent less than last year.

The details are shown in "Statement No. 7."

The practice of using loam for the binding material and on the surface, is to be deprecated, for it is a serious element of weakness in the pavement. It is a fundamental principal of thoroughly good broken stone paving, never to

use clay, loam, or anything that will absorb moisture, on the surface. In dry weather the loam becomes dust and blows off, the surface of the pavement breaks up, and becomes covered with loose stones. In wet weather it becomes mud, is washed off, and the surface of the pavement becomes rough and loose.

Nothing but stone should be used; the surface to be finished with fine stone (not dust) thoroughly rolled in, until the interstices of the coarser stone are thoroughly filled, and the whole surface is firm and hard. Such a surface is less dusty, less muddy, and much more durable, than when the coarse stone are simply covered with loam and rolled.

No finer broken stone pavements can be seen anywhere than in Paris. There it is firmly insisted upon, that everything of the nature of clay or loam must be rigorously excluded. Only pure stone is used in such pavements, the coarser in the bottom, and the finer on top; the finer, thoroughly wedged into the interstices of the coarser by very heavy rollers, until the surface is nearly as firm and smooth as solid rock.

While broken stone pavements have their place, they are not suitable for the business streets of a large city, owing to the excessive cost of maintenance.

There is no one pavement that fulfills all the requirements, for all streets, under varying conditions and traffic. An intelligent study must be made of the requirements in each particular case, and that pavement selected that will best satisfy them.

In general, for our heavy traffic streets, the granite dimension-block pavement will give the best results. For streets of fine residences, or chiefly devoted to offices, the Trinidad sheet asphalt pavement gives excellent results, on comparatively level roadways.

For outlying streets, and where the traffic is light, broken stone pavements will continue to be used, on account of their cheapness in first cost.

The total length and area of street pavement in the City, January 1, 1891, is as follows :

* Telford pavement, ...	260,449 sq. yds,	$13\frac{9.40}{1000}$ miles.
McAdam top dressing, ...	218,676 sq. yds,	$14\frac{6.8}{1000}$ miles.
Stone block, ...	88,058 sq. yds,	$4\frac{2.68}{1000}$ miles.
Coal tar, ...	3,688 sq. yds,	$0\frac{3.08}{1000}$ miles.
Cobble stone, ...	3,816 sq. yds,	$0\frac{1.29}{1000}$ miles.
Asphalt block, ...	2,817 sq. yds,	$0\frac{1.58}{1000}$ miles.
Neuchatel asphalt mastic, ...	1,022 sq. yds,	$0\frac{5.2}{1000}$ miles.
Trinidad sheet asphalt, ...	190 sq. yds,	$0\frac{1.6}{1000}$ miles
Total, ...	578,716 sq. yds,	$33\frac{47.9}{1000}$ miles

GRADING.

Small amounts of grading have been done by contract on the Boulevard, Edwards street, Mechanic street, Peck street and Main street; and by day work on Mansfield street, Munson street, Rock lane and State street. The cost for each is shown in "Statement No. 8."

STREET RAILWAY.

Lines and grades have been given for laying new tracks, and for repairs wherever asked for. The question of the best form of rail for street railways, has been much discussed. But as in the matter of street paving, there is no one pattern that is equally well adapted for all the varying conditions of all the different streets. Each case deserves careful consideration, in order that injustice may not be done, either to the general public or to the street railway companies.

For dirt and McAdam roads, and streets away from the business center, and where the necessity of vehicles crossing the rails in the street is infrequent, the ordinary tee rail (very economical for the railroad companies), is as good as any. But for the crowded business streets where in driving through such streets, it is necessary to cross and recross the rail tracks continually, a pattern of rail should

* Pavements with stone blocks between and outside the rails of horse railroads and next to the gutters, are classed as Telford.

be used that would be no obstruction to the general traffic. It would save to our citizens thousands of dollars annually, in the matter of repairs to wheels and vehicles.

The grooved girder rail, which has a broad flat top containing a narrow groove (too narrow to admit the wheels of ordinary vehicles) in which the flange of the car wheels run, and where the pavement can be laid level with the top of the rail, is no obstruction whatever, to the general traffic. The wheels of ordinary vehicles run over it, or on it, or across it at any angle without apparently noticing it in any way. It is extensively used in foreign cities, and is beginning to be used in some of the more progressive cities of this country. The only objections to it, are that it is more expensive than the usual patterns, and requires a little more care to keep the groove clean. Devices for keeping the groove clean however, are comparatively simple and inexpensive.

While the rail is not suitable for dirt or McAdam roads, some form of grooved rail is the "Coming Rail," for well-paved, well-cleaned business streets. And when it comes here, our people will wonder that they have endured the present inconveniences so long. As a Washington engineer expressed it, "The ordinary forms of street rails will be considered relics of a barbarous age."

WALKS AND CURBS.

Lines and grades for curbs, sidewalks, and street fences, have been given as usual whenever ordered by the board, or upon the request of the Superintendent of Streets, or property owners. This work has required nearly the entire time of one party during the busy season.

SURVEYS AND MAPS.

The principal work of making surveys and maps for public improvements is as follows:

Surveys and Maps for Board of Public Works:

Winter street—extension, from Charles street to Henry street.

Morris street—extension, from Lamberton street southerly.

Washington street—widening, from Liberty street to Congress avenue.

Also fifty-eight sewer-connection maps, showing street lines, curb lines and street numbers; the sewers, their material, sizes and grades; the culverts, basins, manholes and house connection hubs for each street in which sewers were built; also tracings of the same for the use of the Clerk of the Board in issuing permits.

For the Board of Compensation.

For the opening and widening of streets three maps were prepared, and thirty-three maps for assessment of sewers.

The ownership of all property affected by the improvements, has been furnished in all cases, and the titles verified by a careful search of the land records. This work, and also the assessing of cobble gutters, has involved the searching and verifying of titles of over fifteen miles of street frontage.

For Board of Public Works, number of notices for hearings prepared and served,	33
For Board of Compensation for opening and widening streets, number of owners furnished,	28
For Board of Compensation for assessing sewers and pavements, number of owners furnished,	1,005
For Board of Public Works, number of titles searched for assessing cobble gutters,	174
For numbering streets, number of notices prepared and served,	79

The streets re-numbered under orders from the Board of Aldermen were, Clark street, Edward street, Gold street and Lake place.

The proper numbers for new buildings erected during the year have been furnished wherever asked for.

In addition to 160 maps and tracings made for the Boards of Public Works and Compensation, about seventy-five detail plans and profiles, and upwards of forty contracts have been prepared for various public works. Some miscellaneous work has been done also for the Corporation Counsel, and committees of the Court of Common Council.

PARKS.

Arrangements were made with the New Haven Commission of Public Parks, whereby they were to furnish one Assistant for the City Engineer's Department, and in consideration therefor, the Department is to do their engineering.

Surveys and maps were made for the Commission : of West Rock and land near the base of West Rock, Forbes Bluff, Fort Hale and vicinity of old chemical works, Beacon Hill, and for division lines and ownership on West Rock ridge.

A loop of 140 feet diameter to center line of road, has been laid out and built at the north end of Whitney Ridge, overlooking Lake Whitney and the Mill River valley, and connecting with the Farnam Drive. It lengthens the Farnam Drive about 450 feet. The reversed curve connecting with Farnam Drive at the south, was also re-surveyed and improved.

Profiles have been made for proposed drives on Beacon Hill, plans for a small bridge near Fort Hale, and profiles and contracts for grading and curbing Ellsworth Park avenue, and Park avenue from Chapel street to Whalley avenue.

Respectfully submitted,

ALBERT B. HILL, *City Engineer.*

DEPARTMENT OF PUBLIC WORKS—Statement No. 1.

WORK ON SEWERS JANUARY 1, 1890, TO JANUARY 1, 1891.

STREET.	CONTRACTORS.	Length.	Size and Material.	Av'ge Cut.	Character of Excavation.	Contract Price per Foot.	Total Cost.
Admiral st., cor. of Ashmun....	L. O'Brien.....	47.1	18 in. V. P.	13.3	Sand.....	\$2.00 }	
Admiral st., Ashmun to Dixwell	L. O'Brien.....	657.3	15 in. V. P.	15.8	Sand.....	1.60 }	\$2,373.45
Admiral st., Ashmun to Dixwell	L. O'Brien.....	329.4	12 in. V. P.	12.2	Sand.....	1.10 }	
Argyle st., westerly to Newhall.	L. O'Brien.....	207.3	24 in. B. 8 in. I.	11.0	Sand and loam.....	3.00 }	751.77
Ashmun st., Gregory to Admiral	L. O'Brien.....	334.6	18 in. V. P.	12.7	Sand.....	2.00 }	1,822.77
Ashmun st., Admiral to Henry.	L. O'Brien.....	351.9	12 in. V. P.	10.6	Sand.....	1.10 }	
Ashmun st., Grove to Lake pl.	Connor Bros. & Co.....	773.0	12 in. V. P.	11.7	Sand.....	1.15 }	1,963.23
York st., cor. of Ashmun.....	Connor Bros. & Co.....	25.0	15 in. V. P.	11.4	Sand.....	1.28 }	
York sq., cor. of Ashmun.....	Connor Bros. & Co.....	49.0	12 in. V. P.	11.7	Sand.....	1.15 }	
Avon st., Foster to Orange.....	A. Carroll.....	388.6	15 in. V. P.	12.3	Sand and gravel.....	1.50 }	1,654.17
Avon st., Foster to Orange..	A. Carroll.....	332.1	12 in. V. P.	10.2	Sand and gravel.....	1.20 }	
Canner st., And'son to Mechanic	L. O'Brien.....	934.3	48 in. B.	11.2	Sand and gravel.....	7.00 }	
Canner st., And'son to Mechanic	L. O'Brien.....	62.2	48 in. B.	.....	Grillage foundation.	8.00 }	
Canner st., And'son to Mechanic	L. O'Brien.....	152.8	48 in. B.	.....	Pile foundation.....	13.50 }	12,465.70
Canner st., And'son to Mechanic	L. O'Brien.....	63.3	36 in. B.	.....	Pile foundation.....	10.00 }	
Canner st., And'son to Mechanic	L. O'Brien.....	8.0	36 in. Stone	.....	Pile foundation.....	37.50 }	
Carlisle st., Howard av. to Salem	Connor Bros. & Co.....	316.0	15 in. V. P.	12.3	Sand.....	1.38 }	1,233.57
Carlisle st., Salem to Cedar....	Connor Bros. & Co.....	213.5	12 in. V. P.	11.2	Sand.....	1.15 }	
Cedar st., Congress av. to Broad.	F. E. Shaw.....	291.2	12 in. V. P.	10.7	Sand.....	1.20 }	680.41
Cedar st., Congress av. to Broad	F. E. Shaw.....	152.5	9 in. V. P.	10.0	Sand.....	.80 }	
Congress av., Davenport to Arch	A. Brazos & Sons.....	2390.8	24 in. B. 8 in. I.	13.9	Sand.....	3.25 }	11,558.25
Congress av., Arch to Hallock..	A. Brazos & Sons.....	294.6	18 in. V. P.	17.5	Sand.....	2.18 }	
Congress av., Hallock to Ward.	A. Brazos & Sons.....	334.5	15 in. V. P.	15.4	Sand.....	1.75 }	
Cottage st., Liv'gston to Whitney	Connor Bros. & Co.....	318.5	15 in. V. P.	9.6	Sand, rock, water..	1.48 }	2,717.13
Cottage st., Liv'gston to Whitney	Connor Bros. & Co.....	315.6	12 in. V. P.	10.0	Sand, rock, water..	1.35 }	
Dow st., Oak to George.....	F. E. Shaw.....	321.9	12 in. V. P.	10.2	Sand, loam, water..	1.22 }	770.44
Dow st., Oak to George.....	F. E. Shaw.....	158.5	9 in. V. P.	9.8	Sand.....	.80 }	

Dwight st., Oak to George.....	C. W. Blakeslee & Sons	643.8 15 in.	V. P.	10.5 Sand	\$1.35
Dwight st., Oak to George.....	C. W. Blakeslee & Sons	168.4 12 in.	V. P.	10.1 Sand	1.18
Eagle st., cor. of Mechanic.....	City.....	29.8 18 in.	V. P.	11.5 Sand and gravel	1.50
Elm st., Winthrop to Sherman.....	C. W. Blakeslee & Sons	646.6 15 in.	V. P.	15.6 Sand	1.20
Ferry st., Pine to Shore Line R R.....	L. O'Brien.....	596.8 12 in.	V. P.	12.4 Sand	2.00
Ferry st., Shore Line R R to Chatin.....	L. O'Brien.....	278.6 18 in.	V. P.	12.0 Sand and gravel	1.50
Ferry st., Chatham to Lombard.....	L. O'Brien.....	470.6 15 in.	V. P.	11.8 Sand and gravel	1.00
Foster st., Cottage to Avon.....	A. Carroll.....	312.8 12 in.	V. P.	10.9 Sand and gravel	2.00
Foster st., Cottage to Avon.....	A. Carroll.....	34.7 18 in.	V. P.	13.0 Sand and gravel	1.50
Haven st., Grand to Clay.....	C. W. Blakeslee & Sons	256.7 15 in.	V. P.	12.3 Sand and gravel	1.75
Hazel st., Winchester westerly.....	City.....	614.0 15 in.	V. P.	8.9 Sand	.....
Hazel st., Winchester westerly.....	City.....	173.0 18 in.	V. P.	11.0 Sand and loam	.....
Howard av., Minor to Columbus.....	C. W. Blakeslee & Sons	4.0 12 in.	V. P.	10.5 Sand and loam	.....
Livingston st., Lawr'ce to Coff'e.....	Connor Bros. & Co.....	282.1 12 in.	V. P.	11.7 Sand	1.23
Lock st., Canal to Ashmun.....	C. W. Blakeslee & Sons	387.1 24 in.	B. 8 in. I.	10.6 Sand, gravel, water.	3.00
Lock st., Canal to Ashmun.....	C. W. Blakeslee & Sons	348.2 15 in.	V. P.	10.9 Sand	1.40
Mechanic st., Lawr'ce to Canner.....	L. O'Brien.....	179.2 12 in.	V. P.	10.2 Sand	1.20
Mechanic st., Lawr'ce to Canner.....	L. O'Brien.....	1402.2 42 in.	B.	9.8 Sand and gravel	6.00
Mechanic st., Lawr'ce to Canner.....	L. O'Brien.....	80.0 42 in.	B.	 Grillage foundation	7.00
Mill River st., Laurel to Beach.....	F. E. Shaw.....	282.3 42 in.	B.	 Pile foundation	11.00
Mill River st., Beach to State.....	F. E. Shaw.....	573.2 18 in.	V. P.	8.4 Sand, ashes loam, etc	1.55
Mill River st., Beach to State.....	F. E. Shaw.....	309.9 15 in.	V. P.	8.8 Sand and gravel	1.25
Beach st., cor. Mill River st.....	F. E. Shaw.....	321.7 12 in.	V. P.	10.0 Sand and gravel	1.10
Minor st., Lafayette pl. to Liberty.....	C. W. Blakeslee & Sons	30.2 12 in.	V. P.	8.5 Sand and gravel	1.10
Minor st., Lafayette pl. to Liberty.....	C. W. Blakeslee & Sons	168.8 24 in.	B. 8 in. I.	11.0 Sand with water	3.40
Minor st., Liberty to Howard av.....	C. W. Blakeslee & Sons	378.9 18 in.	V. P.	10.7 Sand	1.70
Liberty st., cor. of Minor.....	C. W. Blakeslee & Sons	942.6 15 in.	V. P.	11.4 Sand	1.45
Newhall st., Argyle northerly.....	L. O'Brien.....	24.4 12 in.	V. P.	9.5 Sand	1.23
Newhall st., Argyle northerly.....	L. O'Brien.....	310.5 24 in.	B. 8 in. I.	10.0 Sand and loam	3.00
Nicoll st., northerly to Eagle.....	A. Carroll.....	4.0 15 in.	V. P.	8.6 Sand and loam	2.00
Nicoll st., northerly to Eagle.....	A. Carroll.....	175.5 15 in.	V. P.	10.7 Sand and gravel	1.50
Oak st., Orchard to Day.....	C. W. Blakeslee & Sons	369.6 12 in.	V. P.	10.2 Sand and gravel	1.15
Oak st., Day to Dwight.....	C. W. Blakeslee & Sons	558.3 24 in.	B. 8 in. I.	16.0 Sand	2.98
Oak st., cor. of Dwight.....	C. W. Blakeslee & Sons	321.3 18 in.	V. P.	11.3 Sand	1.65
Oak st., Spruce to Park.....	A. Carroll.....	4.0 12 in.	V. P.	10.1 Sand	1.18
Oak st., Spruce to Park.....	A. Carroll.....	278.4 12 in.	V. P.	13.6 Sand	1.20
					457.14
					2,939.84
					1,120.76
					1,443.66
					4,191.05
					2,900.58
					15,007.82
					1,265.88
					1,657.48
					725.57
					612.21
					1,919.57
					798.75
					3,116.80
					2,708.69
					\$2,120.50

DEPARTMENT OF PUBLIC WORKS—Statement No. 1 (Concluded).

26

STREET.	CONTRACTORS.	Length.	Size and Material.	Average Cut.	Character of Excavation.	Contract Price per Foot.	Total Cost.
Orchard st., Chapel to Edgewood	A. Brazos & Sons.	618.2	24 in. B	8 in. I.	15.0 Sand	\$3.25	
Orchard st., Edgewood to Elm.	A. Brazos & Sons.	655.9	18 in. V. P.	12.6 Sand	1.90	\$5,467.05	
Orchard st., Elm to Whalley	A. Brazos & Sons.	506.6	15 in. V. P.	10.6 Sand	1.55		
Park st., Oak to South.	A. Carroll.	351.4	12 in. V. P.	11.4 Sand	1.20	942.74	
Prince st., Cedar to Liberty.	A. Carroll.	245.8	12 in. V. P.	11.1 Sand	1.15	481.49	
Putnam st., Dewitt to Edgar.	A. Brazos & Sons.	767.1	12 in. V. P.	11.3 Sand	1.20	1,990.43	
Rosette st., Howard av. to Cedar	F. E. Shaw.	350.6	12 in. V. P.	10.8 Sand	1.15	773.62	
Rosette st., Howard av. to Cedar	F. E. Shaw.	196.2	9 in. V. P.	10.0 Sand	.80		
Temple st., Elm to Wall.	City.	515.0	18 in. V. P.	9.3 Sand (old sewer taken up)	.....		
Temple st., Wall to Grove.	City.	382.8	15 in. V. P.	9.4 Sand (old sewer taken up)	.....		
Temple st., Wall to Grove.	City.	4.0	12 in. V. P.	8.0 Sand (old sewer taken up)	.....	1,944.39	
Wall st., cor. of Temple.	City.	31.0	15 in. V. P.	10.2 Sand (old sewer taken up)	.....		
Vernon st., Davenport to Sylvan	C. W. Blakeslee & Sons	415.0	15 in. V. P.	12.1 Sand	1.37	1,563.73	
Vernon st., Davenport to Sylvan	C. W. Blakeslee & Sons	285.0	12 in. V. P.	10.5 Sand	1.17		
Ward st., Congress to Davenport	A. Brazos & Sons.	62.3	15 in. V. P.	13.2 Sand	1.75	1,709.95	
Ward st., Congress to Davenport	A. Brazos & Sons.	610.9	12 in. V. P.	11.4 Sand	1.45		
Ward st., Sylvan av. to Oak.	A. Brazos & Sons.	23.2	15 in. V. P.	11.6 Sand	1.30	1,199.31	
Ward st., Sylvan av. to Oak.	A. Brazos & Sons.	455.4	12 in. V. P.	11.0 Sand	1.20		
Webster st., westerly to Dixwell	A. Brazos & Sons.	589.7	15 in. V. P.	14.1 Sand and loam	1.45	2,517.40	
Webster st., Dixwell to Goffe.	A. Brazos & Sons.	588.2	12 in. V. P.	12.5 Sand	1.25		
Winchester av., Hight'd to Bass't	C. W. Blakeslee & Sons	484.4	36 in. B.	12.7 Sand with water.	6.00	5,903.20	
Winchester av., Bass't to Harriet	C. W. Blakeslee & Sons	327.6	30 in. B.	12.7 Sand with water.	4.25		
Winchester av., Bass't to Harriet	C. W. Blakeslee & Sons	17.8	24 in. B.	12.3 Sand with water.	4.00		
Wolcott st., Poplar to Blatchley	Connor Bros. & Co.	599.2	15 in. V. P.	11.7 Sand and gravel.	1.38	2,282.22	
Wolcott st., Blatchley to Lloyd.	Connor Bros. & Co.	426.9	12 in. V. P.	10.7 Sand and gravel.	1.18		
Wolcott st., James to Lloyd.	A. Carroll.	551.6	15 in. V. P.	12.2 Sand and gravel.	1.50	1,236.86	

DEPARTMENT OF PUBLIC WORKS—Statement No. 2.

SEWERS CONSTRUCTED FROM JANUARY 1ST, 1890, TO JANUARY 1ST, 1891.

LOCATION.	48-inch.	42-inch.	36-inch.	30-inch.	24-inch.	18-inch.	15-inch.	12-inch.	9-inch.	Total length in feet.	Total length in miles.
Admiral street.....							657.3	329.4		1,033.8	
Argyle street.....					207.3	47.1				207.3	
Ashmun street.....						334.6		1124.9		1,459.5	
Avon street.....							338.6	332.1		720.7	
Beach street.....								30.2		30.2	
Canner street.....	1149.3		71.3							1,220.6	
Carlisle street.....							316.	213.5		529.5	
Cedar street.....								291.2	152.5	443.7	
Congress avenue.....					2390.8	264.6	334.5	315.6		2,989.9	
Cottage street.....							348.5	331.9	158.5	664.1	
Dow street.....								168.4		490.4	
Dwight street.....						29.8	643.8			812.2	
Eagle street.....										29.8	
Elm street.....							646.6	596.8		1,243.4	
Ferry street.....						278.6	470.6	312.8		1,062.0	
Foster street.....						34.7	256.7			291.4	
Haven street.....							614.			614.	
Hazel street.....						173.		4.		177.	
Howard avenue.....								282.1		282.1	
Liberty street.....								24.4		24.4	
Livingstone street.....					387.1					387.1	
Lock street.....							348.2	179.2		527.4	
Mechanic street.....	1764.5									1,764.5	
Mill River street.....						573.2	309.9	321.7		1,204.8	
Minor street.....					168.8	378.9	942.6			1,490.3	
Newhall street.....					310.5		4.			314.5	
Nicoll street.....							175.5	369.6		545.1	

DEPARTMENT OF PUBLIC WORKS—Statement No. 2 (Concluded).
SEWERS CONSTRUCTED FROM JANUARY 1ST, 1890, TO JANUARY 1ST, 1891.

LOCATION.	48-inch.	42-inch.	36-inch.	30-inch.	24-inch.	18-inch.	15-inch.	12-inch.	9-inch.	Total length in feet.	Total length in miles.
Oak street.					558.3	321.3	.....	282.4	.....	1,162.	.....
Orchard street.					618.2	655.9	506.6	.....	.....	1,780.7	.....
Park street.								351.4	.....	351.4	.....
Prince street.								245.8	.....	245.8	.....
Putnam street.								767.1	.....	767.1	.....
Rosette street.								350.6	.....	350.6	.....
Temple street.						515.	382.8	4.	196.2	546.8	.....
Vernon street.							415.	285.	.....	901.8	.....
Wall street.							31.	.....	.....	700.	.....
Ward street.							85.5	1066.3	.....	1,151.8	.....
Webster street.							589.7	588.2	.....	1,177.9	.....
Winchester avenue.										829.8	.....
Wolcott street.			484.4	327.6	17.8	.....	1150.8	426.9	.....	1,577.7	.....
York square.								49.	.....	49.	.....
York street.							25.	.....	.....	25.	.....
Total lengths.	1149.3	1764.5	555.7	327.6	4,658.8	3,606.7	9,643.2	9,644.5	507.2	31,857.5	6 ³⁴ / ₁₀₀₀

DEPARTMENT OF PUBLIC WORKS—Statement No. 3.

SEWERS BUILT AND SEWERS IN USE JAN. 1ST, 1891.

SIZE AND MATERIAL.	Sewers Constructed.		Sewers in Use.	
	Feet.	Miles.	Feet.	Miles.
78-inch brick.....	1006.4	.191	1006.4	.191
76-inch brick.....	765.8	.145	765.8	.145
74-inch brick.....	2658.4	.503	2658.4	.503
72-inch brick.....	2747.9	.520	2747.9	.520
70-inch brick.....	3568.9	.676	3568.9	.676
67.6-inch brick and stone.....	1021.5	.193	1021.5	.193
66-inch brick.....	2638.7	.5	2638.7	.5
63.3-inch brick.....	1526.2	.289	1526.2	.289
60-inch brick.....	3546.3	.672	3546.3	.672
57-inch brick.....	710.	.134	350.	.066
54-inch brick and stone.....	548.4	.104	548.4	.104
54-inch brick.....	11930.9	2.260	11930.9	2.260
48-inch brick.....	6645.5	1.259	6645.5	1.259
45-inch brick and stone.....	601.3	.114	601.3	.114
45-inch brick.....	609.4	.115	609.4	.115
42-inch brick.....	10502.4	1.989	10502.4	1.989
39-inch wood....	302.3	.057	302.3	.057
36-inch brick.....	23087.4	4.373	22536.4	4.268
30-inch brick.....	23458.0	4.443	23433.5	4.438
24-inch brick.....	51404.7	9.736	51359.7	9.727
24-inch cement pipe.....	22194.4	4.204	16557.9	3.136
20-inch brick.....	127.5	.024	127.5	.024
18-inch cement pipe.....	23036.	4.363	20194.7	3.825
18-inch vitrified pipe.....	9118.8	1.727	9118.8	1.727
15-inch cement pipe.....	27901.3	5.284	27473.3	5.203
15-inch vitrified pipe.....	47636.5	9.022	47636.5	9.022
12-inch cement pipe.....	16256.2	3.079	16108.2	3.051
12-inch vitrified pipe.....	48679.5	9.219	48647.0	9.214
12-inch brick.....	870.	.165	870.	.165
9-inch vitrified pipe.....	2859.7	.542	2859.7	.542
Unknown.....	2110.	.4	1346.7	.255
Sewers constructed.....	350070.3	66.302	339240.2	64.250
Sewers in use.....	339240.2	64.250		
Sewers discontinued.....	10830.1	2.052		

DEPARTMENT OF PUBLIC WORKS—Statement No. 4.

SEWERS DISCONTINUED IN 1890.

LOCATION.	Size and Material.	Length in Feet.	Length in Miles.
Anderson street, corner of Canner street.	36-in., B.	37.	
Liberty street, corner of Minor street ..	12-in., V. P.	32.5	
Temple street, Elm to Grove streets.....	18-in., C. P.	925.	
Wall street, corner of Temple street.....	18-in., C. P.	37.9	
York street, corner of Grove street.....	18-in , C. P.	4.	
		1036.4	$\frac{197}{1000}$
Sewers built in 1890.....		31857.5	$6\frac{34}{1000}$
Sewers discontinued in 1890.....		1036.4	$\frac{197}{1000}$
Net increase.....		30821.1	$5\frac{837}{1000}$
Length in use Jan. 1st, 1890.....		308419.1	$58\frac{413}{1000}$
Length in use Jan. 1st, 1891.....		339240.2	$64\frac{250}{1000}$

DEPARTMENT OF PUBLIC WORKS—Statement No. 5.

SHOWING AVERAGE CONTRACT PRICE PER FOOT OF SEWERS CONTRACTED
FOR IN 1890.

SIZE.	PRICE.	REMARKS.
48-inch	\$7.00	Brick.
42-inch.	6.00	Brick.
36-inch.	6.00	Brick.
30-inch.	4.25	Brick, 8-inch invert.
24-inch.	3.18	Brick, 8-inch invert.
18-inch.	1.83	Vitrified Pipe.
15-inch.	1.49	Vitrified Pipe.
12-inch.	1.20	Vitrified Pipe.
9-inch.	.80	Vitrified Pipe.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6.

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	24-inch.	15-inch.	12-inch.	9-inch.	12-inch Culvert	Catch Basins.	Manholes.	Total Bid accord- ing to Estimates of Quantities.
Argyle and Newhall streets...	{ Anthony Carroll	\$3.90	\$1.50	.....	.....	\$1.10	\$110.00	\$50.00	\$2,409.00
	{ C. W. Blakeslee & Sons...	3.60	2.00	.....	.....	1.25	110.00	50.00	2,264.00
	{ Connor Bros & Co	3.25	1.50	.....	.....	1.00	110.00	50.00	2,073.50
	{ A. Brazos & Sons.....	3.25	2.00	.....	.....	1.00	100.00	40.00	2,025.50
Cedar street, Congress ave to Broad street.....	{ Lawrence O'Brien*.....	3.00	2.00	.....	.....	.80	110.00	45.00	1,925.00
	{ A. Brazos & Sons.....	.....	.....	\$1.75	\$1.20	.....	.....	50.00	855.00
	{ Patrick Maher.....	.....	.....	1.45	1.00	.....	.....	50.00	735.00
	{ C. B. & F. A. Cadwell....	.....	.....	1.14*	1.14	.....	.....	60.00	693.00
Dow street, Oak street to George street.	{ C. W. Blakeslee & Sons....	.....	.....	1.33	.92	.....	.....	48.00	681.00
	{ Lawrence O'Brien .....	.....	.....	1.25	1.00	.....	.....	50.00	675.00
	{ Frederick E. Shaw*.....	.....	.....	1.20	.80	.....	.....	50.00	630.00
	{ A. Brazos & Sons .....	.....	.....	1.70	1.00	.....	.....	50.00	888.00
Rosette street, Howard ave to Cedar street.....	{ C. W. Blakeslee & Sons....	.....	.....	1.50	.95	.....	.....	48.00	806.00
	{ C. B. & F. A. Cadwell....	.....	.....	1.24	1.14	.....	.....	60.00	750.00
	{ Lawrence O'Brien .....	.....	.....	1.25	1.00	.....	.....	50.00	735.00
	{ Anthony Carroll.....	.....	.....	1.15	1.00	.....	.....	50.00	701.00
	{ Frederick E. Shaw*.....	.....	.....	1.22	.80	.....	.....	50.00	692.80
	{ A. Brazos & Sons.....	.....	.....	1.70	.90	.....	.....	48.00	935.00
	{ Patrick Maher.....	.....	.....	1.45	1.00	.....	.....	50.00	866.50
	{ C. B. & F. A. Cadwell....	.....	.....	1.14	1.14	.....	.....	60.00	807.00
	{ C. W. Blakeslee & Sons....	.....	.....	1.30	.95	.....	.....	50.00	802.00
	{ Anthony Carroll.....	.....	.....	1.15	1.00	.....	.....	50.00	755.50
	{ Lawrence O'Brien .....	.....	.....	1.20	1.00	.....	.....	50.00	774.00
	{ Frederick E. Shaw*.....	.....	.....	1.15	.80	.....	.....	50.00	719.50

*Awarded the contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	24-inch.	18-inch.	15-inch.	12-inch.	10-inch. Culvert.	Catch Basins.	Man- holes.	Total Bid according to Estimates of Quantities.
Congress ave., from Davenport ave. to Ward street, and Ward street from Congress ave. to Davenport ave	{ Lawrence O'Brien	\$4.50	\$3.00	\$2.50	\$1.50	\$1.10	\$110.00	\$60.00	\$15,935.00
	{ Patrick Maher	4.00	2.50	1.75	1.45	1.00	105.00	50.00	14,020.00
	{ Frederick E. Shaw	3.75	2.20	1.52	1.20	.80	100.00	50.00	13,000.00
	{ Anthony Carroll	3.50	2.10	1.90	1.15	1.00	100.00	65.00	12,816.00
	{ C. W. Blakeslee & Sons	3.55	2.26	1.78	1.29	.90	98.00	50.00	12,698.60
	{ A. Brazos & Sons*	3.25	2.18	1.75	1.45	.90	100.00	50.00	12,061.80
Livingston and Cottage streets, Lawrence street, to Whitney avenue	{ C. W. Blakeslee & Sons	3.60	.....	1.95	1.65	1.05	110.00	50.00	3,851.50
	{ A. Brazos & Sons	3.50	.....	1.75	1.35	1.10	110.00	50.00	3,656.00
	{ Lawrence O'Brien	3.40	.....	1.50	1.25	1.00	110.00	50.00	3,482.50
	{ Anthony Carroll	3.50	.....	1.50	1.20	1.00	100.00	50.00	3,447.00
	{ Connor Bros. & Co.*	3.00	.....	1.48	1.35	1.00	100.00	50.00	3,286.50
	{ Patrick Maher	3.60	2.30	1.75	1.40	1.25	110.00	50.00	5,444.50
Oak and Dwight streets, from Orchard street to George street.	{ Anthony Carroll	3.50	2.50	1.75	1.35	1.00	100.00	50.00	5,302.00
	{ Connor Bros. & Co.	3.65	2.10	1.50	1.25	1.00	105.00	55.00	5,212.50
	{ Lawrence O'Brien	3.25	2.00	1.40	1.00	1.00	110.00	50.00	4,840.00
	{ A. Brazos & Sons	2.95	1.80	1.35	1.30	1.00	100.00	47.00	4,545.50
	{ C. W. Blakeslee & Sons*	2.98	1.65	1.35	1.18	.85	98.00	48.00	4,477.40
	{ Lawrence O'Brien	4.00	3.25	1.50	.....	1.00	110.00	50.00	6,430.00
Orchard street, Chapel street to Whalley avenue.....	{ Patrick Maher	3.85	2.50	1.75	.....	1.00	105.00	50.00	5,949.50
	{ E. McManus	4.50	1.72	1.32	.....	1.10	115.00	50.00	5,668.40
	{ Frederick E. Shaw	4.00	1.60	1.22	.....	.80	100.00	50.00	5,138.20
	{ C. W. Blakeslee & Sons	3.50	1.89	1.45	.....	.90	98.00	48.00	5,118.90
	{ Anthony Carroll	3.50	1.70	1.50	.....	1.00	100.00	55.00	5,107.00
	{ A. Brazos & Sons*	3.25	1.90	1.55	.....	.90	100.00	47.00	5,019.50

*Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.					10-inch Culvert	Catch Basins.	Receiving Basins.	Manholes.	Total bid accord- ing to Estimates of Quantities.
Ashmun street, Grove street to Lake place	{ Patrick Maher					\$1.90	\$1.40	\$15.00	\$50.00	\$1,951.00
	{ W. S. Fowler					1.70	1.30	16.00	49.00	1,845.00
	{ Lawrence O'Brien					1.40	1.15	20.00	45.00	1,718.50
	{ A. Brazos & Sons					1.30	1.20	15.00	45.00	1,717.00
	{ Anthony Carroll					1.50	1.15	12.00	50.00	1,710.50
Vernon street, Davenport av to Sylvan avenue.....	{ Connor Bros. & Co*					1.28	1.15	5.00	50.00	1,696.90
	{ Patrick Maher					1.55	1.35	.....	50.00	1,549.00
	{ Anthony Carroll					1.50	1.35	.....	50.00	1,498.00
	{ A. Brazos & Sons					1.48	1.30	.....	48.00	1,465.60
	{ Connor Bros. & Co					1.45	1.20	.....	50.00	1,445.00
Webster street, No. 54 to Goffe street	{ Lawrence O'Brien					1.50	1.00	.....	50.00	1,420.00
	{ C. W. Blakeslee & Sons*					1.37	1.17	.....	48.00	1,373.00
	{ Patrick Maher					1.90	1.45	.....	50.00	2,647.00
	{ Anthony Carroll					1.75	1.30	.....	50.00	2,456.50
	{ Lawrence O'Brien					1.70	1.25	.....	50.00	2,428.00
Wolcott street, James street to Lloyd street	{ W. S. Fowler					1.60	1.28	.....	48.00	2,338.40
	{ Connor Bros. & Co					1.55	1.19	.....	50.00	2,274.70
	{ A. Brazos & Sons*					1.45	1.25	.....	50.00	2,250.50
	{ Patrick Maher					1.85	.....	.....	50.00	1,297.50
	{ A. Brazos & Sons					1.80	.....	.....	50.00	1,265.00
Frederick E. Shaw	{ C. W. Blakeslee & Sons					1.72	.....	.....	50.00	1,224.75
	{ Lawrence O'Brien					1.70	.....	.....	50.00	1,220.00
	{ Frederick E. Shaw					1.55	.....	.....	50.00	1,122.50
	{ Anthony Carroll*					1.50	.....	.....	50.00	1,100.00
	{ Patrick Maher					1.00	100.00	.....	50.00	1,100.00

*Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	18-inch.	15-inch.	12-inch.	10-inch Culvert	Catch Basins.	Manholes.	Total Bid accord- ing to Estimates of Quantities.
Ashmun street, Gregory street to Henry street, and Admiral street, from Ashmun street to Dixwell ave..	{ Anthony Carroll.....	\$2.25	\$2.00	\$1.25	\$1.15	\$100.00	\$65.00	\$4,385.00
	{ Connor Bros. & Co.....	2.00	1.90	1.35	1.00	100.00	50.00	4,082.00
	{ C. W. Blakeslee & Sons.....	2.00	1.95	1.30	1.00	98.00	50.00	4,073.00
	{ A. Brazos & Sons.....	1.88	2.00	1.20	1.00	100.00	50.00	4,000.40
Ferry street, Pine street, to Lombard street.....	{ Lawrence O'Brien*.....	2.00	1.60	1.10	.90	110.00	50.00	3,744.00
	{ Anthony Carroll.....	2.50	1.80	1.50	1.05	115.00	60.00	3,271.00
	{ Connor Bros. & Co.....	2.45	1.75	1.45	1.00	105.00	65.00	3,178.00
	{ A. Brazos & Sons.....	1.80	1.65	1.55	1.00	100.00	48.00	2,848.00
Foster and Avon streets, Cot- tage street, to Orange street.	{ C. W. Blakeslee & Sons.....	2.00	1.65	1.35	.95	100.00	50.00	2,844.00
	{ Lawrence O'Brien*.....	2.00	1.50	1.00	1.00	110.00	50.00	2,735.00
	{ C. W. Blakeslee & Sons.....	2.00	1.73	1.45	1.10	100.00	48.00	2,353.90
	{ A. Brazos & Sons.....	2.25	1.50	1.30	1.25	100.00	50.00	2,189.50
Mill River street, Laurel street to State street	{ Connor Bros. & Co.....	2.25	1.44	1.24	1.00	105.00	50.00	2,133.80
	{ Lawrence O'Brien.....	2.00	1.50	1.15	.75	110.00	50.00	2,133.50
	{ Anthony Carroll*.....	2.00	1.50	1.20	1.00	100.00	50.00	2,133.00
	{ Anthony Carroll.....	2.50	1.90	1.50	1.15	115.00	60.00	3,468.00
Patrick Maher.....	{ Patrick Maher.....	2.50	1.75	1.45	1.00	105.00	50.00	3,275.00
	{ C. W. Blakeslee & Sons.....	1.85	1.55	1.42	1.00	100.00	49.00	2,814.50
	{ Lawrence O'Brien.....	2.00	1.50	1.20	1.00	110.00	45.00	2,800.00
	{ A. Brazos & Sons.....	1.85	1.60	1.40	.90	100.00	45.00	2,781.00
Frederick E. Shaw*.....	{ Connor Bros. & Co.....	1.55	1.35	1.14	1.00	110.00	50.00	2,525.50
	{ Frederick E. Shaw*.....	1.55	1.25	1.10	.80	100.00	50.00	2,438.50

*Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	15-inch.	12-inch.	10-inch Culvert.	Catch Basins.	Manholes.	Total Bid according to Estimates of Quantities.
Oak and Park streets, Spruce st. to South st.	{ Lawrence O'Brien		\$2.00	\$1.00	\$110.00	\$60.00	\$1,790.00
	Patrick Maher		1.60	1.00	105.00	50.00	1,484.00
	A. Brazos & Sons		1.55	1.00	100.00	50.00	1,442.00
	C. W. Blakeslee & Sons		1.43	.90	98.00	48.00	1,348.20
	Frederick E. Shaw		1.35	.80	100.00	50.00	1,304.00
	{ Anthony Carroll*		1.20	1.00	100.00	50.00	1,218.00
Prince street, from Cedar street to Liberty street	{ A. Brazos & Sons		1.70	1.00	.....	50.00	548.00
	Lawrence O'Brien		1.59	1.25	.....	50.00	531.60
	C. W. Blakeslee & Sons		1.42	.95	.....	48.00	474.80
	Frederick E. Shaw		1.25	.80	.....	50.00	432.00
	{ Anthony Carroll*		1.15	1.00	.....	50.00	416.00
Putnam street, Dewitt street to Edgar street.	{ C. W. Blakeslee & Sons		1.38	1.00	98.00	48.00	1,832.60
	Lawrence O'Brien		1.25	1.00	110.00	50.00	1,792.50
	Anthony Carroll		1.20	1.00	100.00	50.00	1,714.00
	Connor Bros. & Co.		1.19	.95	102.00	50.00	1,709.80
	{ A. Brazos & Sons*		1.20	1.00	100.00	47.00	1,696.00
Wolcott street, Poplar st. to Lloyd street.....	{ Patrick Maher	\$1.70	1.40	1.00	105.00	50.00	2,353.00
	W. S. Fowler	1.65	1.37	1.00	100.00	50.00	2,295.40
	A. Brazos & Sons	1.60	1.30	1.00	100.00	50.00	2,236.00
	Anthony Carroll	1.45	1.15	.90	100.00	50.00	2,075.00
	{ Connor Bros. & Co.	1.38	1.18	1.00	100.00	50.00	2,033.60

*Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	15-inch.	12-inch.	10-inch Culvert.	Catch Basins.	Manholes.	Total Bid accord- ing to Estimates of Quantities.
Carlisle st., How- ard av to Cedar street.....	{ A. Brazos & Sons.	\$1.50	\$1.40	\$1.00	\$100.00	\$48.00	\$1,144.00
	{ Anthony Carroll.....	1.50	1.35	1.00	100.00	50.00	1,140.00
	{ Patrick Maher.....	1.45	1.29	1.20	110.00	50.00	1,140.00
	{ Lawrence O'Brien.....	1.40	1.20	1.00	100.00	50.00	1,098.00
	{ C. W. Blakeslee & Sons.	1.42	1.25	.85	100.00	49.00	1,085.40
	{ Connor Bros. & Co.*...	1.38	1.15	1.00	105.00	50.00	1,071.60
Elm street, from Winthrop av to Beers street....	{ Anthony Carroll.	2.50	1.75	1.00	100.00	60.00	3,492.50
	{ Lawrence O'Brien.....	2.00	1.25	1.00	110.00	60.00	2,907.50
	{ A. Brazos & Sons.....	1.60	1.38	1.00	100.00	50.00	2,618.20
	{ C. W. Blakeslee & Sons*	1.50	1.20	.85	98.00	48.00	2,414.00
	{ Anthony Carroll.....	2.25	.....	1.15	125.00	50.00	2,089.00
Haven st., Grand ave to Clay st.	{ A. Brazos & Sons.....	1.80	.....	1.00	112.50	55.00	1,788.50
	{ Lawrence O'Brien.....	1.70	.....	1.00	110.00	50.00	1,694.00
	{ C. W. Blakeslee & Sons*	1.75	.....	.90	100.00	50.00	1,689.00
	{ Patrick Maher.....	2.10	1.75	1.00	105.00	50.00	1,303.60
	{ A. Brazos & Sons.....	2.00	1.75	1.10	100.00	50.00	1,284.00
Nicoll street, from No. 84 Nicoll st. to Eagle street.	{ Frederick E. Shaw.....	2.00	1.75	.80	100.00	50.00	1,272.00
	{ C. W. Blakeslee & Sons.	1.80	1.43	1.00	105.00	50.00	1,133.80
	{ Lawrence O'Brien.....	1.70	1.20	1.00	110.00	50.00	1,038.00
	{ Anthony Carroll*.....	1.50	1 15	1.00	100.00	50.00	974.00

* Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Continued).

COMPARISON OF BIDS FOR SEWERS 1890.

LOCATION.	CONTRACTORS.	36-inch.	30-inch.	24-inch.	18-inch.	15-inch.	12-inch.	10-inch Culvert.	Catch Basins.	Rec. Basins.	Man-holes.	Total Bid according to Estimates of Quantities.
Lock street from Canal street to Ashmun street ...	{ A. Brazos & Sons.....	.....	.....	.....	.....	\$1.55	\$1.48	\$1.00	\$100.00	.....	\$48.00	\$1,208.10
	{ L. O'Brien.....	.....	.....	.....	.....	1.40	1.00	1.00	110.00	.....	50.00	1,100.00
	{ C.W. Blakeslee & Sons *	.....	.....	.....	.....	1.40	1.20	.85	100.00	.....	48.00	1,097.50
Minor st., & Howard av., Lafayette pl., to Columbus av..	{ A. Brazos & Sons.....	.....	.....	\$4.50	\$2.60	1.75	1.25	1.00	107.50	.....	55.00	5,328.00
	{ L. O'Brien.....	.....	.....	4.50	2.25	1.50	1.20	1.00	110.00	.....	50.00	4,912.00
	{ C.W. Blakeslee & Sons *	.....	.....	3.40	1.70	1.45	1.23	.87	98.00	.....	48.00	4,343.10
Ward st., Sylvan av., to Oak st....	{ Patrick Maher.....	.....	.....	.....	.....	1.90	1.45	1.00	105.00	\$15.00	50.00	1,224.50
	{ L. O'Brien.....	.....	.....	.....	.....	1.75	1.25	1.00	110.00	25.00	50.00	1,150.00
	{ W. S. Fowler.....	.....	.....	.....	.....	1.70	1.25	1.00	98.00	16.00	48.00	1,107.50
	{ Connor Bros. & Co. ....	.....	.....	.....	.....	1.44	1.19	.90	100.00	5.00	50.00	1,064.70
	{ Anthony Carroll.....	.....	.....	.....	.....	1.75	1.15	.90	100.00	12.00	50.00	1,063.00
Winchester avenue, Highland to Harriet streets.....	{ A. Brazos & Sons*.....	.....	.....	.....	.....	1.30	1.20	.95	100.00	15.00	45.00	1,059.50
	{ A. Brazos & Sons.....	\$6.50	\$5.70	4.00	.....	.....	.....	1.00	100.00	.....	45.00	5,926.00
	{ L. O'Brien.....	6.50	5.00	4.00	.....	.....	.....	1.00	110.00	.....	55.00	5,795.00
	{ Connor Bros. & Co.	6.30	4.60	4.25	.....	.....	.....	1.00	100.00	.....	50.00	5,497.00
	{ C.W. Blakeslee & Sons *	*6.00	4.25	4.00	.....	.....	.....	1.00	110.00	.....	50.00	5,282.50
LOCATION.	CONTRACTORS.	48-inch with Gril-lage.	48-inch.	42-inch with Piling.	42-inch with Gril-lage.	42-inch.	36-inch with Piling.	10-inch Culvert.	Catch Basins.	Man-holes.	Bulk-head.	Total Bid
Mechanic and Canner sts., Lawrence st., to Anderson.	{ Connor Bros. & Co....	\$12.00	\$8.25	\$7.45	\$12.00	\$8.40	\$8.40	\$1.00	\$100.00	\$40.00	\$365.00	\$26,865.50
	{ C.W. Blakeslee & Sons	13.15	9.75	6.65	12.75	9.25	6.10	1.20	105.00	50.00	413.00	25,481.50
	{ A. Brazos & Sons.....	11.50	9.00	7.50	11.00	8.80	8.00	1.00	100.00	45.00	335.00	25,309.00
	{ L. O'Brien*.....	13.50	8.00	7.00	11.00	7.00	6.00	1.00	110.00	40.00	300.00	24,415.00

* Awarded the Contract.

DEPARTMENT OF PUBLIC WORKS—Statement No. 6 (Concluded)

COMPARISON OF BIDS FOR SEWERS, 1890.

LOCATION.	CONTRACTORS.	PRICE.	Total Bid according to Estimates of Quantities.
Pile and timber foundation for the Boulevard sewer, from Congress ave to Oak street.....	M. A. Blakeman.....	\$7.80	\$24,570.00
	C. R. Waterhouse.....	6.39	20,128.50
	C. W. Blakeslee & Sons...	6.29	19,813.50
	Robert Lutz.....	6.25	19,687.50
Sum of the highest bids.			\$137,340.70
Sum of the lowest bids.			113,700.70
Difference			\$23,640.00

DEPARTMENT OF PUBLIC WORKS—Statement No. 7.
SHOWING STREETS HARDENED DURING 1890.

STREET.	LOCATION.	Material.	Work Done.	Square Yards.	Cost per Square Yard.	Total Cost.
Bradley street...	Whitney avenue to Orange street.....	Broken stone	Hardening ..	2,800	.42 $\frac{1}{4}$	\$1,184.56
Daggett street...	Congress avenue to Washington street.....	Broken stone	Hardening ..	3,167	.44 $\frac{3}{4}$	1,418.00
George street...	Day street to Orchard street.....	Broken stone	Hardening ..	2,480	.50 $\frac{3}{4}$	1,258.51
Howard avenue.	South Water street to N. Y., N. H. & H. R. R.	Broken stone	Hardening ..	22,167	.39 $\frac{7}{8}$	8,832.62
Orange street...	Lawrence street to Willow street.....	Broken stone	Hardening ..	5,693	.36 $\frac{1}{2}$	2,049.74
South street...	Davenport avenue to Howard avenue.....	Broken stone	Hardening ..	2,138	.38 $\frac{3}{4}$	829.41
*Temple street...	Grove street to Trumbull street.....	Broken stone	Hardening ..	3,173	49 $\frac{1}{8}$ —	1,580.94

*Includes work done in December, the beginning of the next fiscal year.

DEPARTMENT OF PUBLIC WORKS—Statement No. 8.

SHOWING STREETS GRADED DURING 1890.

STREET.	LOCATION.	COST.
*Boulevard	Sea street to Kimberly avenue.....	\$80.74
*Canner street.....	Nicoll street to Mill River.....	555.76
*Edwards street.....	Whitney avenue to Prospect street (sidewalks).....	630.67
Mansfield street.....	Compton street to Munson street.....	339.75
*Mechanic street.....	Eagle street to Canner street.....	1,729.33
Munson street .....	.....	41.76
Peck and Main streets.	Monroe street to Lombard street.....	391.17
Rock lane	Everit street to Mill River.....	529.77
State street.....	Near Albert street.....	205.50

*Not completed.

DEPARTMENT OF PUBLIC WORKS—Statement No. 9.

SHOWING REPAIRS ON PAVEMENTS AND STREET HARDENING DURING 1890.

STREET.	LOCATION.	Kind of Pavement.	WORK DONE.	COST.
Broadway.....		Broken stone....	Repairs.....	\$75.68
Brewery street...		Broken stone....	Repairs.....	97.02
Chapel street.....		Broken stone....	Repairs.....	380.07
Crown street.....		Broken stone....	Repairs.....	166.38
Court street.....		Broken stone....	Repairs.....	102.71
Court street.....		Stone block....	Repairs.....	12.00
Congress avenue...		Broken stone....	Repairs.....	1,545.51
Church street....		Broken stone....	Repairs.....	78.85
Columbus avenue		Broken stone....	Repairs.....	117.51
College street.....	George to Crown.	Broken stone....	Repairs.....	305.48
Davenport avenue.	South street to West River.	Broken stone....	Top dressing.....	4,193.23
Elm street.....		Broken stone....	Repairs.....	621.02
East street.....		Broken stone....	Repairs.....	15.41
Fair street.....		Broken stone....	Repairs.....	15.70
George street.....		Broken stone....	Repairs.....	392.16
Grand avenue.....		Broken stone....	Repairs.....	57.57
Grand avenue.....	Near R. R. Bridge.	Belgian block...	Repairs.....	84.00
Howard avenue....	Kimberly avenue to Columbus avenue.	Broken stone....	Top dressing.....	2,584.02
Orange street.....		Broken stone....	Repairs.....	17.96
Olive street.....		Broken stone....	Repairs.....	162.59
Oak street.....		Broken stone....	Repairs.....	85.52

State street. ....	.....	Broken stone.	Repairs.	\$1,831.54
State street. ....	.....	Belgian block.	Repairs.	45.60
St. John street. ....	.....	Broken stone.	Repairs.	124.01
Sylvan avenue. ....	.....	Broken stone.	Repairs.	43.10
Temple street.	Congress avenue to Crown	Broken stone.	Repairs.	658.72
Union street. ....	.....	Belgian block.	Repairs.	117.00
Union street. ....	.....	Broken stone.	Repairs.	62.35
Wooster street. ....	.....	Broken stone.	Repairs.	882.31
Whalley avenue. . .	.....	Broken stone.	Repairs.	245.01
Water street. ....	.....	Belgian block.	Repairs.	8.71
York street. ....	.....	Broken stone.	Repairs.	56.83

DEPARTMENT OF PUBLIC WORKS—Statement No. 10.

SHOWING WORK ON BRIDGES DURING 1890.

NAME.	LOCATION.	WORK DONE.	COST.	
Barnesville...	Grand avenue...	Repairs and painting.....	\$238.66	\$82.18
Bridge st.....	Causeway.	Repairs.....		177.71
Chapel st.....	Mill River.....	Repairs.....	720.00	958.66
Chapel st.....	Mill River.....	Salary draw tender.		
Congress av..	West River.....	Repairs.....		33.34
Fair st.....	Over railroad track	Repairs.....		17.68
Grand av.....	Quinnipiac River..	Repairs.....		338.48
Grand av.....	Over railroad track	Repairs.....		91.03
Kimberly av..	West River.....	Repairs.....		20.63
Lewis st.....	Quinnipiac River.	Repairs		126.51
Martin st. ...	West River.....	Repairs.....		110.10
Neck bridge..	Mill River.....	Painting.....		115.14
Orange st....	Mill River.....	Fence on causeway.		109.02
Quinnipiac ...	Quinnipiac River.	Salary draw tender.	500.00	3,373.80
Quinnipiac ...	Quinnipiac River.	Gates... ..	1,112.91	
Quinnipiac ...	Quinnipiac River .	Repairs.....	1,411.04	
Quinnipiac ...	Quinnipiac River.	Painting.....	349.85	
Rock lane....	Mill River....	New bridge paid 1889	5,826.60	11,109.50
Rock lane....	Mill River.....	New bridge paid 1890	5,281.90	
Tomlinson's ..	Quinnipiac River.	Salary draw tender.	750.00	1,134.00
Tomlinson's...	Quinnipiac River.	Repairs, etc.....	384.00	
Washington ..	West River.....	Repairs & planking		513.53

DEPARTMENT OF PUBLIC WORKS—Statement No. 11.
SHOWING OPENINGS OF DRAW BRIDGES DURING 1890.

MONTH.	TOMLINSON BRIDGE DRAW.							QUINNIPIAC DRAW.							CHAPEL STREET DRAW.					
	Times Opened.	Steamers.	Sch'rs.	Barges.	Sloops.	Sharpies.	Total.	Times Opened.	Steamers.	Sch'rs.	Sloops.	Sharpies.	Barges.	Total.	Times Opened.	Tugs.	Barges.	Sch'rs.	Scows.	Total.
December, 1889 . . .	1149	718	45	110	19	402	1294	427	216	4	7	310	13	550	190	186	81	26	7	300
January, 1890 . . .	959	847	40	54	21	115	1077	341	200	7	14	110	8	339	44	44	21	6	...	71
February, 1890 . . .	816	640	47	68	26	129	910	284	183	19	10	117	6	335	57	56	25	10	...	91
March, 1890 . . .	914	830	49	85	27	170	1161	330	210	18	7	125	12	372	93	92	41	18	...	151
April, 1890 . . .	1596	870	98	179	61	740	1948	460	248	14	10	450	10	732	183	181	83	23	5	292
May, 1890 . . .	1760	960	78	137	56	850	2081	466	250	5	12	465	15	747	193	200	92	20	8	320
June, 1890 . . .	1273	840	56	130	47	340	1413	385	200	6	10	370	8	594	203	199	87	14	19	319
July, 1890 . . .	2065	1450	174	177	220	740	2761	577	310	200	160	435	32	1137	199	197	92	24	10	323
August, 1890 . . .	1254	970	61	137	58	470	1696	396	275	8	14	380	12	689	193	193	79	20	17	309
September, 1890 . .	1167	840	61	139	59	580	1679	394	248	10	16	362	14	650	117	176	68	10	23	277
October, 1890 . . .	1375	840	69	135	54	620	1718	425	220	8	12	530	16	786	227	226	105	21	4	356
November, 1890 . . .	1425	840	51	110	34	580	1615	407	235	10	14	490	14	763	195	192	90	27	21	330
Total	15753	10645	829	1461	682	5736	19353	4892	2795	309	286	4144	160	7694	1894	1942	864	219	114	3139

DEPARTMENT OF PUBLIC WORKS—Statement No. 12.

SHOWING SIDEWALKS LAID DURING 1890.

Street.	Between what points.	Side.	Material.
Alton.....	Main to Ferry path.....	South..	Top dressed.
Artisan.....	Court to St John.....	Both...	Concrete.
Bishop....	Orange to Whitney av.....	North..	Curb.
Bishop.....	Orange to Whitney av.....	North..	Concrete.
Blatchley av..	Peck to State.....	West...	Curb.
Blatchley av..	Peck to State.....	West...	Concrete.
Blatchley av..	No. 321 to Shore Line R. R.....	East...	Curb.
Blatchley av..	No. 321 to Shore Line R. R.....	East...	Concrete.
Blatchley av..	Chapel to Saltonstall av.....	Both...	Top dressed.
Blatchley av..	Saltonstall av. to Woolsey.....	East...	Top dressed.
Canner.....	Orange to Livingston.....	Both...	Curb.
Castle	Main to Monroe.....	Both...	Concrete.
Cassius.....	Cedar to Howard av.....	South..	Concrete.
Chapel.....	Poplar to Ferry.....	North..	Top dressed.
Chapel.....	Nos. 809 to 821.....	North..	Flagging.
Chestnut.....	St. John to 170 ft. south.....	East...	Concrete.
Church.....	Nos. 38 to 44, 104 to 108.....	West...	Flagging.
Church.....	Nos. 57, 59, 187.....	East...	Carbonized stone.
Clay.....	Poplar to Ferry.....	North..	Top dressed.
College.....	North and South cor. Wall.....	West...	Carbonized stone.
Congress av....	Nos. 6 to 8, 141 to 151.....		Flagging.
Daggett.....	Congress av. to Washington.....	Both...	Curb reset.
Dixwell av....	Webster to Foote.....	West...	Top dressed.
Ferry.....	Pine to the R. R.....	East...	Top dressed.
Greenwich av..	200 ft. N of 4th street to 5th street..	West...	Curb.
Greenwich av..	200 ft. N of 4th street to 5th street..	West...	Concrete.
Greenwich av..	5th street to 6th street.....	West...	Curb.
Greenwich av..	5th street to 6th street.....	West...	Concrete.
George.....	Day to Orchard.....	Both...	Curb reset.
Grand av.....	Haven to Lloyd.....	North..	Top dressed.
Grand av.....	Ferry to Bright.....	North..	Top dressed.
Grand av.....	Perkins to N. Front.....	North..	Top dressed.
Grand av.....	Fillmore to Poplar.....	South..	Top dressed.
Grove.....	College to York.....	North..	Concrete.
Howard av....	4th street to South Water.....	East...	Concrete.
Kimberly av..	Boulevard to the Bridge.....	East...	Graded.
Livingston....	Canner to Lawrence.....	East...	Curb.
Lloyd.....	Grand to Clay.....	West...	Concrete.
Lloyd.....	Chapel to 100 ft. south.....	East...	Concrete.
Mechanic.....	Lawrence to Eagle.....	West...	Curb.

DEPARTMENT OF PUBLIC WORKS—Statement No. 12 (Concluded).
SHOWING SIDEWALKS LAID DURING 1890.

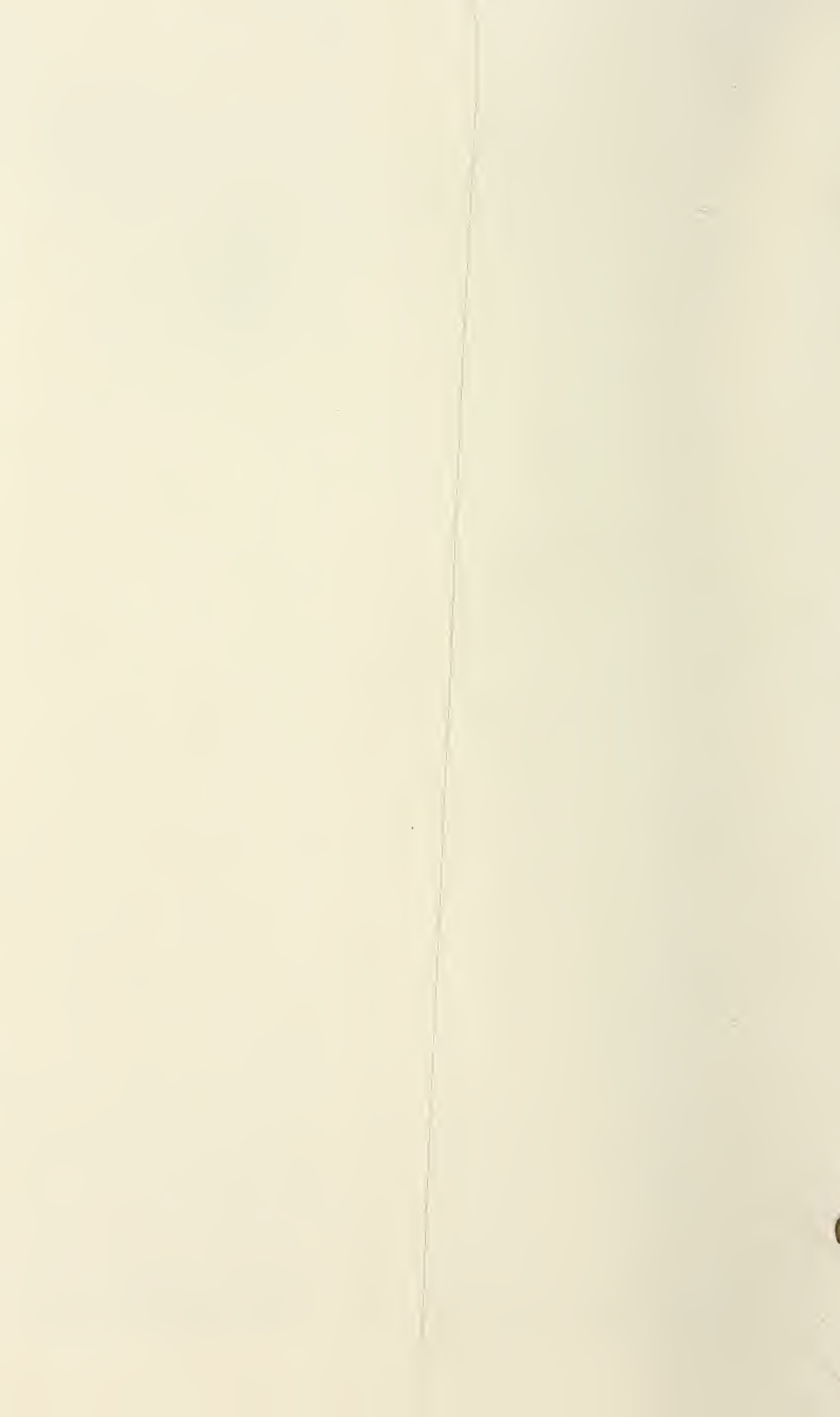
Street.	Between what points.	Side.	Material.
Mechanic.....	Lawrence to Eagle.....	West...	Concrete.
Mechanic.....	Lawrence to 500 ft. north.....	East...	Curb.
Mechanic.....	Lawrence to 500 ft north.....	East...	Concrete.
Mansfield.....	Compton to Highland Place.....	East...	Curb.
Mansfield.....	Compton to Highland Place.....	East ..	Concrete.
Meadow.....	Nos. 29, 206 to 210.....	.....	Carbonized stone.
Olive.....	Nos. 154 to 178, 118.....	West...	B'k and concrete.
Olive.....	Nos. 71 to 77, 157, 169, 173.....	East...	Top dressed.
Orange.....	Canner to Cold Spring.....	West...	Curb.
South.....	Davenport av. to Park.....	Both...	Curb reset.
Saltonstall av..	Blatchley av. to Ferry....	South...	Curb.
Saltonstall av..	Blatchley av. to Ferry.....	South..	Concrete.
State.....	Mill River street to bridge.....	East...	Concrete.
State ...	James to Blatchley av.....	East...	Curb.
State	James to Blatchley av.....	East...	Concrete.
State.....	Ferry to Lyman.....	East...	Curb.
State.....	Ferry to Lyman.....	East...	Concrete.
State.....	150 ft. north of Lyman to Albert..	East...	Curb.
State.....	150 ft. north of Lyman to Albert..	East...	Concrete.
State.....	Nos. 114 to 138.....	West...	Flagging.
Temple.....	Oak to George.....	Both...	Curb reset.
Temple.....	Grove to Trumbull.....	Both...	Curb reset.
Wall.....	College to 200 ft. west.....	Both...	Carbonized stone.
Whalley av....	Norton to Nott.....	South..	Concrete.
Whalley av....	Dwight to University Place.....	South..	Curb reset.
Whitney av....	Lawrence to City line.....	East...	Concrete.
Willow.....	Orange to Nicoll.....	South..	Concrete.
Winthrop av....	Elm to Whalley av.....	West...	Top dressed.
Winthrop av....	Derby av. to 300 ft. S. of George..	West...	Top dressed.
Woolsey.....	James to Lloyd.....	North..	Top dressed.

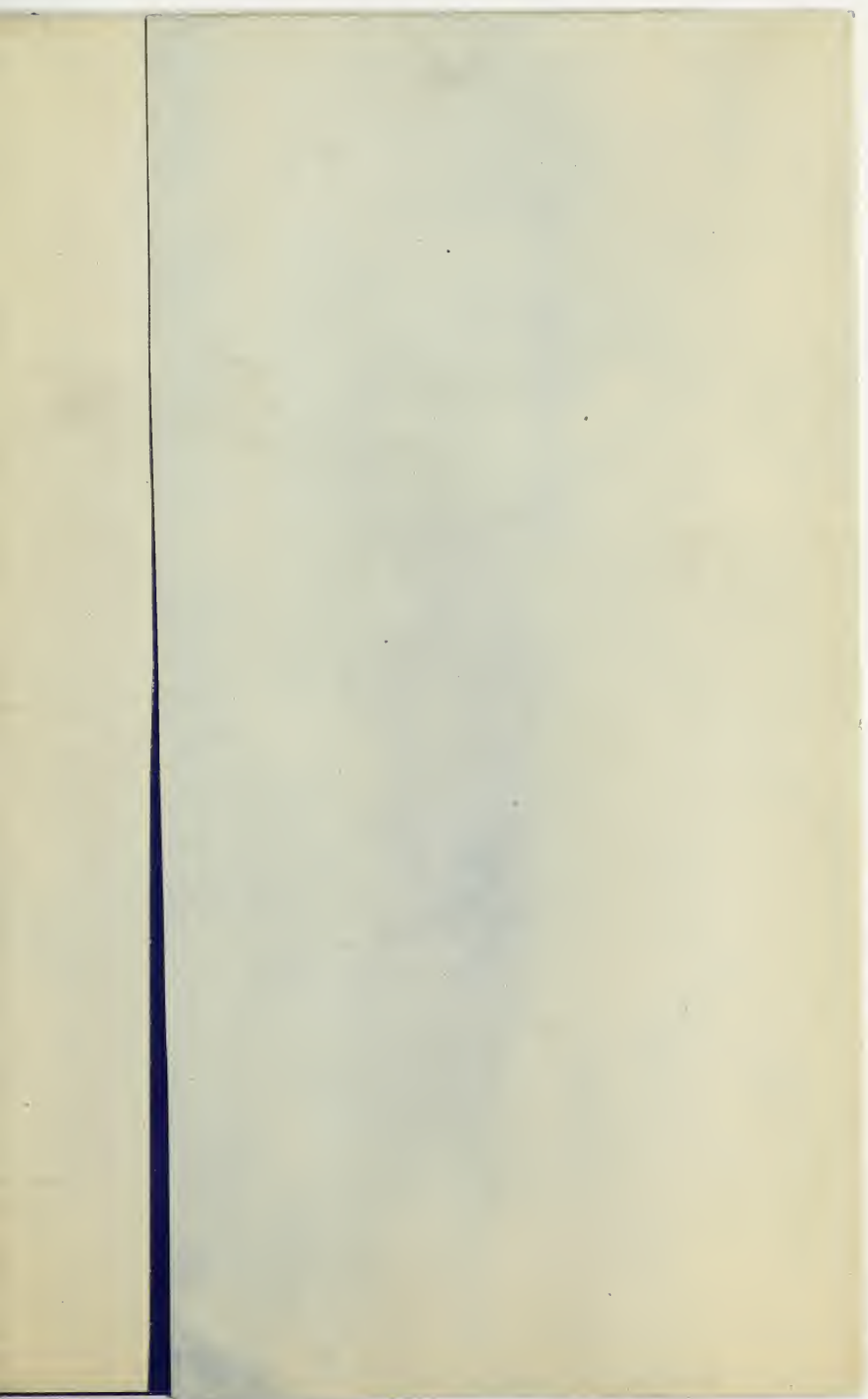
STREET DEPARTMENT—Statement No. 13.

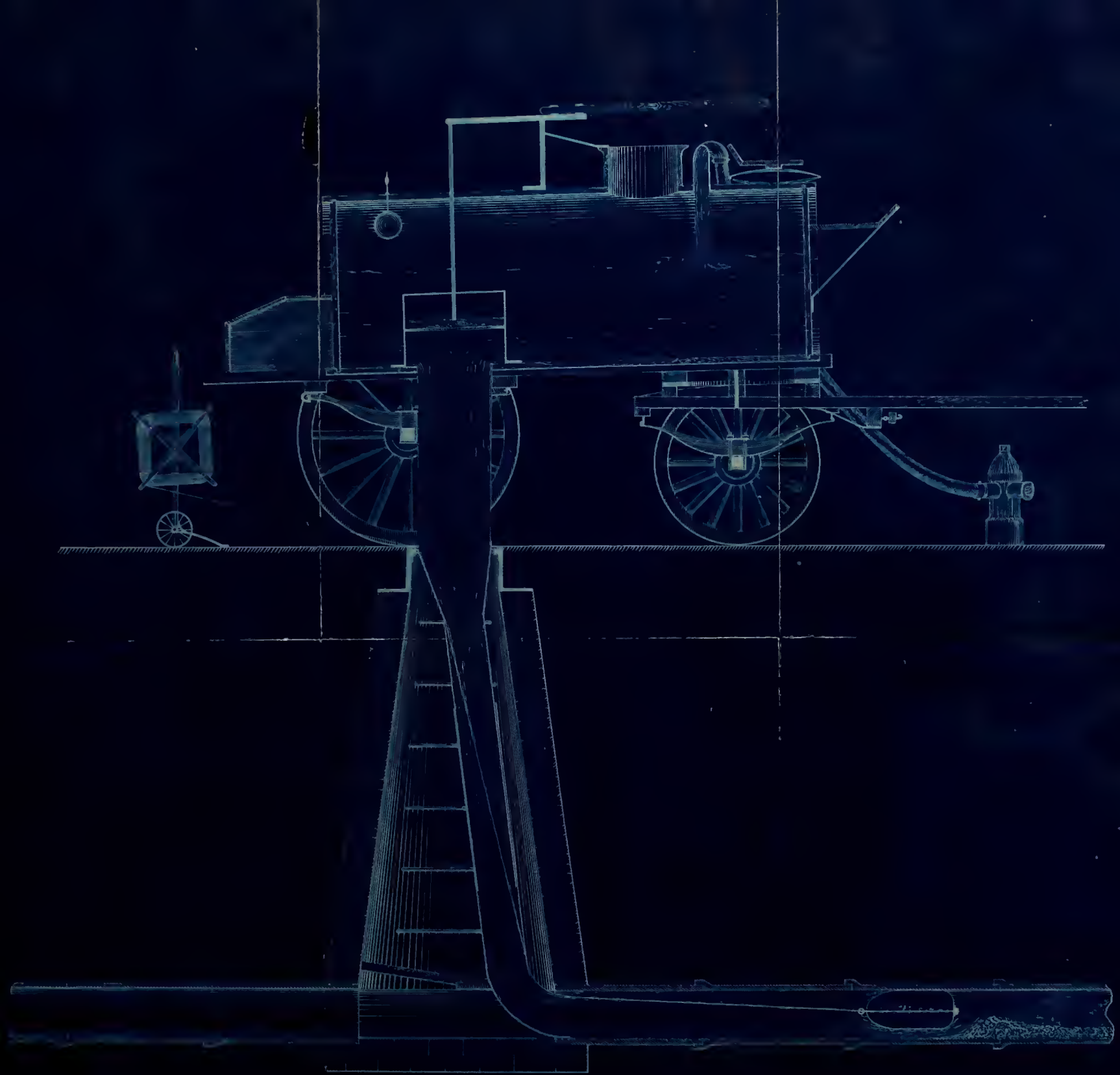
SHOWING CROSSWALKS LAID DURING 1890.

Street.	Location.	Side.
Blatchley avenue.....	across Peck street.....	East
Blatchley avenue.	across Peck street.....	West
Bradley street.....	across Grand avenue.....	East
Congress avenue.....	between Hill and Lafayette streets.	
Cottage street.....	across Orange street.....	North
Carlisle street.....	across Dewitt street.....	South
Chapel street.....	across Norton street.....	South
Dwight street.....	across Whalley avenue.....	East
Dixwell avenue.....	across Lake place.....	East
Foote street.....	across Goffe street.....	South
Grand av.....	across State street.....	South
Highland street	across Whitney avenue.....	North
Houston street.....	across Pierpont street.....	West
Howard avenue.....	across Fourth street.....	East
Howard avenue.....	across Fifth street.....	East
Howard avenue.....	across Sixth street.....	East
Howard avenue.....	across Sea street.....	East
Howard avenue.	across Kimberly avenue.....	West
James street.....	across Alton street.....	East
James street.....	across Lombard street.....	East
Lake place.....	across Dixwell avenue.....	North
Lloyd street.....	across Chapel street.....	East
Lloyd street.....	across Grand avenue.....	West
Lawrence street.....	across Whitney avenue.....	North
Mechanic street.....	across Lawrence street.....	West
Mansfield street.....	across Prospect place....	West
Poplar street.....	across Saltonstall avenue.....	West
Poplar street.....	across Wolcott street.....	West
Prince street.....	across Hill street.....	North
Second street.....	across South Front street.....	South
State street.....	across Ferry street.....	East
University place.....	across Whalley avenue.....	East
Whitney avenue.....	across Edward street.....	West
Whitney avenue... ..	across Lawrence street.....	West
Whitney avenue.....	across Canner street.....	West
Whitney avenue.....	across Highland street.....	West
Whitney avenue.....	across Suburban street.....	West
Whitney avenue.....	across Cottage street.....	West
Whitney avenue.....	across Willow street.....	East









SEWER FLUSHING APPARATUS.

NEW HAVEN CONN.

Designed by the
CITY ENGINEER DEPT.



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